ELIMINATION DIETS

AND

THE PATIENT'S ALLERGIES

A HANDBOOK OF ALLERGY

BY

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TO

MY BROTHER

CHARLES HENRY ROWE, M.D.

PREFACE

The purpose of this new edition continues to be twofold; first to emphasize the importance of food allergy in the production of many allergic manifestations along with the value of the writer's revised elimination diets for the study of possible food allergy, and second to discuss the other causes of clinical allergy with present day methods for their diagnosis and control. Many changes and additions have been made throughout the entire book, because of which this second edition has been entirely reset.

The fallibility of the skin test, especially for the determination of foods, and to a less extent of inhalants causing clinical allergy, is receiving increasing recognition by the profession. Likewise the necessity of trial diet for the study of possible food allergy is more generally appreciated. For fifteen years the writer's elimination diets have been used successfully in his clinic and private practice for such trial diet, and many other physicians have used them for this purpose.

Failure to use trial diet as a usual routine for the study of food allergy accounts in a large measure for the delay in the full appreciation of its important rôle in clinical allergy. Moreover when trial diet has been utilized many patients with acute and chronic symptoms have not been relieved because such diet trial has not been properly and adequately conducted as discussed in Chapter V. At times trial diet has not been used because of fear of possible resultant nutritional damage. Under nutrition, unfortunately, has resulted from some trial diet, especially from test negative diets. This has occurred when lists of foods to be excluded have been given the patient without accompanying menus and recipes which assure balanced meals and proper protection of the patient's nutrition. When the elimination diets, however, are employed with detailed menus and recipes, and when the necessary directions for their use are followed, routine and sufficient diet trial is possible without danger of nutritional impairment. As long emphasized by the writer these diets should be used in diagnosis, as are blood counts and other laboratory tests. Their use implies that the physician suspects and has not *a priori* determined that food allergy is present in the patient.

Detailed menus and special recipes are necessary for the successful use of diet trial for the following reasons. Such menus and recipes make possible the total exclusion of all foods eliminated from the diet. This

is necessary during the initial period of diet trial when a maximum degree *of food allergy must be assumed.* A trace of an allergenic food may prevent relief. After relief is assured, the degree of allergy can be determined and the necessity of partial or *total exclusion of the allergenic* foods for an extended period can be decided. Trial diet usually must continue for more than a few days. The symptoms and results of much food allergy are not relieved by fasting for twenty-four hours or by the exclusion of the allergenic foods for two or three days. Especially is this true when chronic manifestations such as perennial bronchial asthma, nasal or sinal allergy, longstanding migraine or headache, and infantile or atopic eczema are present. The allergens usually remain in the blood and tissues for days, and possibly for longer periods, after the foods have *been excluded from the diet.* The usual necessity of trial diet from one to several weeks, therefore, is evident. Such periods are also required *when recurrent manifestations of allergy to common foods occur every* few days or weeks with complete or partial intervening relief due to refractoriness. The necessary protection of nutrition and weight with this prolonged diet trial is assured with the proper use of the elimination diets with their menus and recipes.

The writer continues to use his cereal-free elimination diet most often because of the frequency of group sensitization to several of the cereal grains. The elimination diets for infants and young children with proper menus have been of special value. With the fruit-free elimination diet, *it has become increasingly apparent that allergy to all or most fruits* along with other food allergies must receive consideration in patients with urticaria, gastro-intestinal symptoms, allergic toxæmia, and less frequently with other allergic manifestations. The low calory elimination diet for the obese patient and the menus for diabetic patients with possible food allergy are again recommended. During the last two years the frequency of food allergy and rarely of inhalant allergy as a major cause of ulcerative colitis, of mucous colitis, and the irritable or unstable colon, have become more evident in the writer's practice. The possible rôle of *bacterial allergy also must be studied. Therefore in this edition a modified* elimination diet is included for the study of food allergy in these patients with colitis and a discussion of the use of the diet and of other indicated types of therapy is included.

The economically prepared formula for the soy bean substitute for cow's milk has been slightly revised and directions for its preparation simplified. Recipes for the bakery products for the cereal-free diets have been revised, especially with the exclusion of lima bean flour which is

difficult to obtain in some states and foreign countries. Since the texture and fat content of soy bean flours vary according to the method of their processing, specified flours of two well known manufacturers should be used by patients or by dietitians to obtain the best results with these revised formulæ and recipes. The value of liquified strained meats as a source of protein in the diets of older infants, young children, and infants, is discussed for the first time. A formula utilizing this liquified meat for infants who are allergic to animal milk and legumes is also included.

The effect of the war on the elimination diets is discussed on page 152. The scarcity of tapioca requires substitutes suggested in the menus for the cereal-free diet. The rationing of meat, sugar, oil, canned fruits and vegetables often requires the physician's order for additional amounts from the rationing board. The new recipes for bakery products in the cereal-free diets have been necessary because of the diminishing supply of lima bean flour. These effects on the elimination diets will disappear as the war terminates.

The causes and methods of control of inhalant, infectant, injectant, and contactant allergy are discussed and the necessity of the consideration of them along with food allergy is stressed throughout the volume. The frequency of more than one type of allergy in the production of clinical manifestations, especially of bronchial and nasal allergy and atopic dermatitis, must be remembered. The information in the chapters on Diagnosis, Causes of Allergy and their Control, and the Manifestations of Clinical Allergy and their Treatment has been amplified and revised in light of recent contributions and experience of other allergists and of the writer. The summary of the recognized and possible manifestations of clinical allergy with their likely allergenic causes in order of probable frequency has been added on page 19.

I wish to thank Carl L. Mauser, M D., once again for his help in the study and treatment of our patients and Jane Hyde for her supervision of the preparation of antigens and skin testing. I also am grateful to Mary Woodward and Ruth Hulen for their efficient dietary instruction of patients Especially am I indebted to Eva Court whose experience in dietetics is of constant help in the arrangement of menus and recipes for my elimination diets.

ALBERT H. ROWE, M.D.

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Elimination Diets and the Patient's Allergies

CHAPTER I

ELIMINATION, TEST NEGATIVE AND OTHER TRIAL DIETS

The Elimination Diets were devised to aid physicians in making a diagnostic study of food allergy in patients who have symptoms which arise from food allergy with varying degrees of frequency. These diets were first proposed by the writer in 1926 and were revised by him in 1933. In 1941 several changes were made in them in order to increase the possibility of discovering sensitizations in a larger number of food-sensitive patients. *The diets are composed of those foods which infrequently produce clinical allergy* The determination of these foods was made by skin reactions, by histories of food idiosyncrasies and by trial diets. Their allergenic activity was checked by the production of symptoms after they had been eaten

THE FALLIBILITY OF SKIN TESTS

It is generally agreed that clinical allergy may exist in the absence of positive skin reactions, especially those to the scratch test. This is true primarily in food allergy and to a lesser extent in inhalant allergy. When definite symptoms arise within an hour after allergenic foods have been eaten, good immediate scratch reactions often occur [illegible] scratch reactions *frequently* [illegible] within a few hours or a day [illegible] which produce symptoms only after they have been eaten on successive days.

These negative reactions probably are due to the absence in skin and blood of the specific reacting antibodies which are present in the cells of the shock tissues. Cellular disturbances from the interaction of these specific antibodies and the allergen are responsible for the symptoms. Furthermore, it has been postulated, as recently restudied by Cooke, that allergy to the products of protein digestion rather than to the original food protein itself accounts for the negative reactions to the protein allergen. Also, Tuft has demonstrated the presence of skin-reacting bodies to the allergens in fresh and not in cooked fruits

Skin testing, especially by the intrad[illegible]

Therefore, the clinical significance of any positive skin reaction must be determined by clinical trial—that is, by the eating of the food or by the inhaling of the allergen by the symptom-free patient. Because of these non-specific reactions and because of the frequent absence of positive reactions to allergenic foods, the writer has discontinued the intradermal method in the routine testing for food allergy. In most cases of suspected food allergy he uses trial diet with the elimination diets.

Thus, when positive skin reactions to food allergens are obtained, especially with the intradermal test, the physician must keep in mind, first of all, that the reactions may or may not indicate those foods which produce the symptoms and, secondly, that foods to which the patient is allergic may give negative reactions. Furthermore, the size of the positive reaction does not always indicate the degree of possible clinical sensitization; therefore diets in which the foods that give the largest positive reactions are excluded usually are ineffectual.

TEST NEGATIVE DIETS

In spite of the vagaries of skin testing for food allergy, *certain patients are relieved by diets in which skin reacting foods are eliminated.* Such diets have been well named by Rackemann, Test Negative Diets. The relief of a few patients unfortunately has encouraged many physicians to place unwarranted confidence in the test negative diets. However, the fact that symptoms are not relieved does not by any means exclude the possibility that food allergy is a cause of the symptoms. It must be stressed that the allergenic effect of a suspected food can be determined only by the reproduction of the symptoms in the patient who has become symptom-free through the elimination of causative foods. Thus, the test negative diets frequently exclude foods which are not productive of allergy. This is especially true if the intradermal test is used, since it often gives false reactions or those indicative of past or potential sensitization. Some allergists advise the exclusion of all foods which give even slight reactions by the intradermal tests. Retesting on several occasions is advised if relief does not occur. During this process additional reactions may occur and others may disappear so that gradually most of the foods eaten by the patient may come under the suspicion of allergy. The possible allergenicity of such reacting foods is always in question and, as stated above, can be determined only by feeding them to the symptom-free patient.

These test negative diets often make the preparation of satisfactory meals difficult, especially when all foods that give slight or suspicious reactions, particularly with the intradermal test, are eliminated. It may be impossible to arrange balanced meals with the essential protein, minerals, vitamins, and calories with such non-reacting foods. The necessity of providing each patient with definite menus which protect nutrition and proper weight whenever a test negative or an elimination diet is prescribed is discussed further on page 137.

Thus, if test negative diets alone are used to diagnose food allergy, many patients will fail to receive relief and will be denied the benefit to be derived from the discovery and elimination of all allergenic foods. *These test negative diets are prescribed by the writer only when definite positive reactions obtained with the scratch test check with the patient's history of probable food idiosyncrasies.* Moreover, in the majority of his patients who are suspected of food allergy the elimination diets, modified by a history of probable food allergies and by definite skin reactions by the scratch method as described throughout this book, are used for the diagnostic study of possible food allergy. The elimination diets, moreover, may be used without the scratch tests if these are not available.

MODIFIED ELIMINATION DIETS

When the elimination diets were first described, the writer suggested that physicians modify them according to the patients' requirements in various countries or in various regions of our own country. Foods similar to some in the routine elimination diets may be more available or less costly. Thus, Richet published slight modifications of the diets in France and various students in America suggested changes. All these contributions have added in different degrees to the availability and utility of trial diet and many [illegible]

How [illegible] *were su*[illegible] intenti[illegible] elimination diets contain only as many of the foods which are infrequently productive of allergy as are required to prepare meals that can be taken for a sufficiently long period to allow adequate study of possible food allergy. It would seem unwise therefore to add extra foods, spices, and beverages until the object of diet trial has been attained—namely, a definite symptom-free period which is much longer than before diet trial was instituted. To such a diet, productive of freedom from symptoms, various foods may gradually be added. In order that the allergenicity of each food may be ascertained, five to seven days should be allowed to elapse between additions. Thereby the degree of allergy and the necessity of total or partial exclusion of allergenic foods can be determined. In the analysis of the allergenic effect of such additional foods, the physician should keep in mind the varying time of onset and degree of the reactivity of foods, the varying sites of tissue reaction to different foods, the variation in allergic tolerance itself, and the effect of natural desensitization or refractoriness which arises after or during an allergic reaction. These influences are more fully discussed on page 54.

Foods which have been ingested over a period of months or years may have to be omitted from the diet for at least one or two weeks before evidence of clinical relief occurs. This fact is not fully appreciated by those who state that food allergy can be ruled out if the symptoms are not relieved by the elimination of suspected foods for two or three days. In fact, the persistent and chronic tissue changes arising from food and other allergies which are so evident in atopic eczema and in chronic bronchial and nasal allergy

may require many days or weeks of complete freedom from the causative allergens before cellular function and structure are restored. Inhalant allergies may also necessitate weeks of hyposensitization or elimination before the tissues return to an approximately normal condition. Thus, elimination diets must be so arranged that they can be eaten over a period of days, weeks, or even months without nutritional damage or undesirable weight loss, as discussed on page 140.

Furthermore, *the writer has stressed the importance of the exclusion of every trace of the foods* that are excluded from the elimination diets *during the study of possible food allergy.* Until the symptoms are relieved and a subtracted food can be fed to the symptom-free patient in order to determine the degree and severity of its clinical activity, it should be assumed that a maximum degree of allergy to that food exists. This is important since the sole object of the elimination diets is relief of symptoms. *Unfortunately in some of the modified elimination diets proposed by others, traces of foods have been included which are excluded completely from the writer's diets.* For instance, in some diets butter or an oleomargarine has been included. The latter contains minute amounts of milk which may be sufficient to prevent relief in patients markedly sensitive to milk. Even the odor of an allergenic food may produce symptoms in some patients. In certain modifications of the elimination diets, Melba wheat toast or other heated denaturized foods, such as canned milk, have been recommended. Here again, experience indicates that patients markedly sensitive to a given food cannot eat it even if it has been subjected to high temperatures. Denaturization of these foods is not complete and symptoms arise from their use even though sensitized guinea pigs will not react to them. In some instances these modified diets have not provided the patient with explicit menus and have not stressed the necessity of the elimination of every trace of a food not included in the diet. The frequent occurrence of pepper allergy is illustrative Asthma occurred in one patient and angioneurotic edema in another if food containing a trace of pepper was eaten. In another patient allergy to cottonseed was so great that the allergen in Crisco used in biscuits was enough to perpetuate the disease. Therefore as will be noted throughout this book, successful diet trial depends on the exclusion of every trace of a food not included in the prescribed diet while possible food allergy is being studied, especially that eaten in friends' homes, in restaurants or in hotels, as discussed on page 139. *This care must be exercised until the symptoms have been relieved or the rôle of food allergy is excluded.* If food allergy is demonstrated, tolerance for the allergenic foods may be determined by further diet trial.

The elimination diets originally were formulated with these ideas in mind. In their past and present modifications the writer has insisted on the total exclusion of all foods not included in the diets. The proper preparation and arrangement of meals so that nutritional balance is assured during a period long enough to rule food allergy in or out as a cause of the symptoms are always necessary.

WHY ARE THE ELIMINATION DIETS PREFERABLE TO WHEAT-, MILK-, AND EGG-FREE DIETS?

Since wheat, milk, and egg produce more allergy than any other three foods, physicians frequently have advised the exclusion of these foods only for diagnostic study. Usually explicit menus and recipes for wheat-, milk-, and egg-free diets have not been given so that small amounts of *these foods unintentionally* have been eaten. Since marked food allergy requires the complete exclusion of every trace of the allergenic foods, patients sensitive to these important foods have not been relieved.

However, when the elimination diets with the menus as detailed in Chapter V are used, the patient is provided with a definite list of prescribed foods, with recipes for bakery products which are wheat-, milk-, and egg-free, and with menus for balanced meals so that nutritional damage will not occur. Thus, *the elimination diets provide the patient with accurate menus which are wheat-, milk-, and egg-free. Moreover, it must be remembered that much allergy also exists to other foods which are excluded from the elimination diets, especially to fish, nuts, spices, the cabbage group of vegetables, oranges, apples, bananas, berries, tea, coffee, honey, and other foods.* In the elimination diets not only wheat, milk and egg are excluded, but also these other foods which are productive of allergy in varying degrees. Allergy may also exist to the various foods in the elimination diets as discussed on page 143, but to a lesser degree than to those foods excluded from such diets When allergy to foods in the diets is suspected or exists, other foods may be substituted, as recommended in Chapter V. For a few patients with extensive food sensitizations, the supplemental diets outlined on page 147 may have to be used.

FOOD ADDITION DIETS

For one elimination diet, *the writer has recommended the use of milk alone for a period of one, two, or more weeks* with the possible addition of sugar and tapioca which rarely produce allergy. Such a diet may be used initially in infants, young children, and undernourished adults who apparently have no idiosyncrasy to milk who [illegible]

foods, one or [illegible]

duce the syn[illegible]

The institution of diet trial with one food such as milk was recommended especially by O. H. Brown who called such study *the food addition method* Milk is the best food to use for this purpose It, as well as its products, such as cottage cheese, butter, and cream, can be taken in amounts sufficient to maintain weight and nutrition over a period of two or three weeks or for a shorter period if the symptoms thereby are definitely controlled However, the milk diet presents several disadvan-

tages. Approximately 20 to 30 per cent of all food-sensitive patients apparently are allergic to milk in varying degrees. The probable mild or subclinical sensitizations to milk may be greater. Therefore 1 of every 2 or 3 patients may not be relieved by the milk diet after its sole use for two or three weeks.

Other diet trial with one food which will meet nutritional requirements is extremely difficult. If milk allergy is suspected, if maintenance of weight is not a problem, and if the patient's will-power is adequate, peas, both fresh and in a split pea purée, may be taken during the initial period. Other individual foods containing protein which protect the protein metabolism, such as meat and other legumes, may be used, provided undesirable weight loss does not result. However, single foods other than milk for diet trial of seven to fourteen days, are difficult from the patient's viewpoint, while the elimination diets are much more desirable and practicable. Confining the diet to milk for one or two weeks is distasteful to most individuals while the sole use of any other food is less satisfying and at the same time endangers nutrition. *These objections are not present with the use of the elimination diets if they are properly prescribed and prepared as described in this volume.*

CHAPTER II

DIAGNOSIS OF ALLERGY

A careful analysis of the patient's history often yields information of great value in the final determination of possible allergenic causes. This history may be recorded according to the plan found on page 20. The frequency of allergy, as discussed on page 52, must be kept in mind in taking such a history. Since allergy may arise from substances that enter the body through the mouth and digestive tract, that are inhaled and absorbed through the nasopharynx, the conjunctivæ and the bronchial tract, or that enter the tissues from foci of infection or from diseased tissue in the body itself or from contact with skin, the physician must question the patient with all these possible types of allergy in mind.

ALLERGIC HISTORY

Allergy should be suspected if any of its recognized manifestations are found in the past or present history of the patient or have occurred in the family history, especially in the parents, aunts, uncles, and grandparents.

Summary of Manifestations.—These manifestations of allergy with their probable or possible causes in order of importance are summarized as follows:

MANIFESTATIONS OF CLINICAL ALLERGY

Types of Allergy Responsible According to Probable Frequency

(1) Bronchial asthma, allergic bronchitis and croup.
(a) [illegible]

(2) N. [illegible]
(a [illegible] fungi (spores), (6) foods, (7) bacteria
(b) Perennial. (1) animal emanations and dusts, (2) foods, (3) orris root, pyrethrum, kapok, cottonseed, silk, etc., (4) fungi (spores), (5) bacteria, (6) drugs.

(3) Atopic Dermatitis (due to blood-borne allergens).
(a) Foods, (b) *Pollens*, (c) *Animal* emanations including silk, (d) Orris, pyrethrum, kapok, cottonseed, etc., (e) House and *other dusts*, (f) Infectants—fungi, bacteria.

(4) [illegible] Physical causes.

(5) Angioneurotic Edema (*deeper blood*-vessels of skin are shock tissues) (causes same as Item 4).

(6) Contact Eczema (epidermal cells are sensitized).
Contactants of all types [illegible] use as [illegible] (a)

(8) Migraine, sick headaches, cyclic vomiting and recurrent bilious attacks.
(a) Foods, (b) Inhalants, (c) Bacteria?.
(Recurrent peripheral neuralgia and pareses and idiopathic epilepsy at times due to allergy.)

(9) Allergic Toxemia: (a) Foods, (b) Pollen, (c) Bacteria.

(10) Gastro-intestinal allergy (canker and recurrent cold sores, oral and pharyngeal inflammation, distention, pyrosis, anorexia, nausea, vomiting, abdominal cramping and pain, peptic ulcer?, diarrhea, constipation, mucous and chronic ulcerative colitis, irritable bowel, proctitis, pruritis ani, with varying frequency due to allergy).
(a) Foods, (b) Drugs, (c) Bacteria and Parasites, (d) Inhalants.

(11) Ocular—seasonal and perennial conjunctivitis, recurrent iritis and corneal ulcers, ocular and orbital pain (blephalitis) and dermatitis of the lids. (See migraine.) Inhalants and foods most important and vary according to the manifestation. Drug and bacterial allergy also causative.

(12) Miscellaneous.
(a) Cardio-vascular: (1) susceptibility to transient cardiac irregularities, (2) thrombo-angiitis obliterans?, (3) periarteritis nodosum?, (4) erythema nodosum and multiforme, (5) glomerulonephritis?, (6) hypertension (occasional case).
(a) Foods and drugs, (b) Bacteria, (c) Inhalants including tobacco.
(b) Arthropathies: (1) arthralgia, (2) possible rôle of food and bacterial allergy in rheumatoid arthritis, (3) intermittent hydrarthrosis and tendosynovitis.
(a) Foods, (b) Bacteria, (c) Drugs, (d) Inhalants?.
(c) Urogenital: (1) allergic cystitis, (2) spasm in ureter and bladder, (3) Hunner's ulcer?, (4) vulval canker-like lesions and inflammation, (5) menstrual pain and leucorrhea (occasionally).
(a) Foods, (b) Drugs, (c) Bacteria, (d) Inhalants.
(d) Allergic purpura, agranulocytosis: (1) drugs, (2) foods, (3) bacteria?.
(e) Allergic fever: (1) foods, (2) inhalants?, (3) sera and drugs (ingestant and injectant), (4) infectant allergies?.
(f) Isosensitization due to RH blood factor
(a) Erythroblastosis fetalis, (b) Transfusion reactions.

It must be stressed as is done in Chapter IV, that although allergy is responsible for these many and varied symptoms in varying degrees of frequency, it is only one of several causes that needs careful consideration by the physician. Allergy needs more definite study when certain manifestations such as asthma, hay fever, eczema, or migraine are present than when nausea, constipation, or menstrual disturbances occur. However, the physician must keep allergy in mind as a possible factor in all patients, as is indicated by the discussion of allergy in the average population on page 52 An adequate study of allergic possibilities is especially important when any of the symptoms which have been listed above are encountered.

History of the Allergic Patient

The systematic recording of the history expedites the diagnosis. It may be recorded under the following headings:

1. Bronchial Manifestations: Onset, frequency, periodicity, and chronicity of the attacks or persistent symptoms, amount and character of the sputum, frequency and degree of cough, fever, complications,

geographic and seasonal influences, and former history of bronchial symptoms.

2. Nasal and Sinusal Symptoms: Duration, amount, and degree of seasonal or perennial nasal congestion, regional or geographic influences, blocking, sneezing, itching, nasal or postnasal discharge, sinusal congestion or pain, and former history of head colds or sinusitis.

3. Dermatoses: Onset, duration, and distribution of allergic dermatitis (eczema), contact dermatitis, urticaria, or angioneurotic edema during life, with possible etiological comment.

4. Gastro-intestinal Symptoms: Occurrence of canker sores and other oral, gastro-intestinal, and abdominal symptoms with their duration, degree and characteristics, and possible relation to allergy.

5. Recurrent headaches, migraine, biliousness, fatigue, or "toxic states" Frequency, duration in years and severity.

6. Genito-urinary, cardio-vascular, glandular, nervous, or psychoneurotic disturbances, with data for or against allergy as a primary or complicating cause.

7. Dietary History: Dislikes or disagreements for foods of all types, and habits of eating Questions such as, "Do you drink milk, eat eggs, or spinach?" may suggest allergy, digestive inefficiency, whims or fancies, or psychoneuroses. Potential or active nutritional deficiencies must be recognized as emphasized by McLester and Minot.

8 Drug History: Possible allergy to medicaments even those used infrequently, including all given orally, parenterally, cutaneously and into all body cavities.

9. Environmental History: The kinds of carpets, curtains, furnishings, mattresses, pillows, bedding, furs, clothing, animals, plants, flowers, cosmetics, toilet accessories, and similar information concerning the living, sleeping, working, and recreational environments. Likewise, the names of trees, shrubs, flowers around the house, the character of the surrounding region, whether built up or in the country, its proximity to barns, animals, fields, orchards, forests, or marshes, the amount and character of dusts, and similar information.

Family History: Bronchial, nasal, cutaneous, gasteo-intestinal, or other symptoms, especially migraine, recurrent headache, toxic or bilious states in several generations and progeny, with a record of possible [illegible] usual infor- [illegible] habits.

Past History: Past or present infections or illnesses not noted above.

Menstrual History and the possible influence on or of allergy.

Operations: Year and results of operations, especially on the nose and throat.

Habits· Amount of tobacco and alcohol and their influence on allergy.

Family History of Allergy.—As has already been stated, a carefully recorded *family history* of possible allergy is important as a diagnostic aid. Although all persons are victims of one or another type of allergy,

as noted on page 52, *the propensity to develop allergy and the degree and type of allergic manifestations are definitely heightened and influenced by heredity.* If allergy is present on both sides of the family the progeny is predisposed to more definite allergy than when it is present in one parent or in his relatives. Analysis of family histories reveals that one manifestation such as asthma, nasal allergy, dermatitis or migraine has a tendency to occur in a number of relatives and in successive generations. Many patients may have several manifestations simultaneously, one of which may be especially severe. Moreover, the tendency toward pollen, animal emanation, or food allergy frequently is determined by inheritance and the susceptibility to allergy to one food such as milk, egg, fish, or fruit occasionally may recur in family members for several generations.

Diet History.—*A dietary history must be carefully recorded in every patient who is suspected of allergy* To do so would seem a wise routine in all patients seen by any physician since thereby food sensitizations, at times of great importance, can often be appreciated. The physician should ask first of all, "Are there any foods that you definitely dislike or that disagree with you?" If an affirmative answer is given more details about reactions to such foods should be obtained. Then specific questions about each food should be asked. "Do you drink milk?" Frequently the answer will be "I hate milk," or "I never took it willingly since infancy," or "It always nauseates me," or "It is poison to me." Other specific questions should be asked, such as "Do you eat eggs?" if not "Why not?" "Do you like and eat meat?" Similar questions about fish, nuts, vegetables, fruit, bread and bakery products yield information which will justify the expended time. Habits of eating, whether or not symptoms occur after banquets, meals in restaurants or in friends' homes must be ascertained so that unusual foods which cause allergy may be found The diagnostic value of a history of food dislikes and disagreements is discussed on page 57

Drug Allergies.—A history of possible drug allergies should be *routine in the study of all allergic patients.* The drugs which most frequently produce allergy are noted on page 88. Direct questions such as "Does aspirin agree with you?" "Has quinine upset you?" "What physics do you take?" "Is phenolphthalein in any of them?" "Does codein or morphine cause nausea or other distress?" "What other medicines have you taken and have any of them disagreed with you?" "What ointments, salves, hair lotions, dentifrices, mouth washes or douching solutions do you use?" "Do they cause irritation, burning or eruptions?" These and other questions must be asked in order to assemble all the important information

Environmental History.—*The so-called environmental history is an important part of all histories of allergic patients.* Notice should be taken of all vegetation, such as trees, shrubs, flowers and even the vines on the house, as well as of all animals including fowls that are encountered around the home or during the daily routine. On a farm, the type of

work done by the patient or the kind of hay, feed, and farm products to which he is exposed is important.

Causes of inhalant and contactant allergies, as discussed in Chapter III, often can be suspected from a carefully taken history. Careful analysis of the patient's daily and weekly routine may suggest that such an allergen is encountered only in the house, in the office, on the train, in a friend's home, during recreation, or in some other special environment. Allergy may thus be found to substances such as cat, horse, or other animal hair, feed or grain dusts, spores of fungi encountered in damp houses, orris root or karaya gum at the hair dresser's, and various plant or pollen allergens in gardens or in the open country.

In the house, the number in the family, the type of work each performs, whether the dust from work or recreation is brought in, the kind of mattresses, bedding, pillows, carpets, animals or birds present, the animal skins, furs, insect powders or chemicals in the rooms or closets, and similar information may be of great value. When contact dermatitis is suspected, the [illegible]

[illegible]

all types of inhalant and contact allergens encountered by the patient in his occupational routine also must be analyzed. Taking such a history has long been practiced by the writer according to the plan presented on page 20. Such a routine assures thoroughness of analysis and grouping of information.

As an aid in obtaining important information from the patient, a questionnaire as presented on page 205 may be of value. It may be filled out by the patient during his absence from the doctor's office and with the help of the family.

SKIN TESTING

Cause and Mechanism of Reactions.—When the allergen or reacting substance of foods, inhalants, certain drugs, and bacteria comes in contact with the vascular and other cells just below the superficial epidermal surface, an urticarial skin reaction may occur. *The reaction depends on the presence of so-called reacting bodies in the skin of a patient who is specifically allergic or hypersensitive to the allergen of the substance being tested.* These reacting antibodies may be present in the skin, and either absent or present in such small amounts in other body tissues that allergic reactions cannot develop in them. Furthermore, they may not be present in the cells of the skin or blood and may only occur in the cells of the shock tissue wherein the allergic symptoms arise. The negative skin reaction in the presence of active allergy to an allergen is explained thereby as already discussed on page 13. The positive reaction arises from increased permeability of the capillaries in the affected area with resultant edema or accumulation of plasma, lymph, white, and eosinophilic blood cells in the tissue. Vascular dilatation, which produces erythema, usually surrounds the edematous hive-like swelling or wheal.

The edema may follow the peripheral lymph channels and produce pseudopodia which cause irregularities in the outline of the wheal. The reaction occurs within ten to twenty minutes, its speed of appearance and its size depending on the number of reacting bodies in the skin, and usually on the degree of allergy present. However, at times, large skin reactions may indicate only potential allergy and may be unaccompanied by clinical manifestations. The reaction begins to fade in twenty to forty minutes and may disappear entirely in one or two hours. However, in patients with large reactions and especially marked allergy, deep cutaneous and even subcutaneous edema may occur, and may persist for one or two days. So-called delayed reactions may arise in six, twelve, or twenty-four hours after the test. These consist of a red papule ⅛ to ¼ inch in diameter which may be surrounded by erythema and may exude a small amount of purulent or serous exudate. The scratch and intradermal tests reach a maximum in twenty to thirty minutes. The results are recorded by plus marks. Four plus, for instance, is a large reaction. Very large reactions may be indicated by 6+ to 10+. The size of the wheal and also of the surrounding erythema may be *recorded by diameters* measured in millimeters.

Scratch or Puncture Test.—*All skin testing should first be done by the scratch or puncture test. Intradermal tests should only be done with allergens which have failed to react by the scratch technic since initial intradermal testing has led to severe and dangerous constitutional reactions* when it was done with allergens which would have given positive scratch tests. The scratch test is executed by making a superficial scratch ¼ inch long with a dull knife or needle so that blood is not drawn. The allergen is then applied with a toothpick or dropper If a dry allergen is used, it should be moistened with N/10 NaOH or with normal salt solution. The allergen is then rubbed into the scratch with a clean toothpick. *The so-called puncture test* is done by piercing the skin with a sterile needle through a drop of applied liquid allergen The tests are best made on the upper arms, forearms and back, although the legs and abdomen may be used, especially if patients do not wish the scratches to show *Various areas of the skin react differently*. The back usually gives larger reactions than the arms or legs. *Under no circumstances should 10 per cent NaOH be substituted for the dilute N/10 NaOH*. The former may produce necrosis and permanent scarring of the skin. Patients, other than infants and small children, may be tested by the scratch method with 180 to 250 food, animal emanations, dust, and inhalant allergens and with all important pollens. These tests may be made on the arms and back by experienced technicians in two to three hours. It may be advisable to do the testing in two different sittings. Infants and young children should be tested on several occasions with only the most important foods and ingestants. The less important ones should be reserved for future testing if the symptoms are not adequately relieved by treatment.

Intradermal Test.—*Intradermal tests are done only with those allergens which have failed to react by the scratch test.* When the extracts are stand-

ardized by nitrogen determinations, an extract containing 0.01 mg. per cc. may be injected initially. If the test is negative a stronger extract may be used later. In the writer's work, 1 to 200 dilutions of the dry allergens by weight are routinely used for intradermal testing. A 1 to 50 glucose extract may be used if negative reactions with the 1 to 200 extracts have occurred However, the intradermal injection of a concentrated glycerin extract will produce a localized necrosis. The amount injected intracutaneously should be between 0.01 and 0.02 cc. The resultant reaction has characteristics similar to those of the positive scratch test. From 10 to 60 of these intradermal tests may be done at one time on a patient, other than an infant or a young child, without fear of constitutional reactions, provided no allergen which has reacted by the scratch method is used. *Thus it is possible to test a patient by the scratch and intradermal methods in one or two days and to obtain the history, physical examination, and laboratory, and X-ray studies in the same period.* In this manner the patient's time and money are conserved.

In the writer's practice intradermal tests [illegible] important [illegible] Routine [illegible] d by the scratch test is not done, since many confusing and false, and certain negative reactions occur, as previously discussed on page 13. For the study of possible food allergy, in the majority of patients elimination diets are depended upon rather than the test negative diets, as noted on page 134.

Passive Transfer (Prausnitz and Kustner) Test.—The passive transfer reaction is utilized occasionally in patients who are so young, so sick, or so covered with dermatitis that skin testing is inadvisable or impossible Prausnitz and Kustner, in 1921, discovered that the serum of a patient who is clinically sensitive to an allergen to which a large skin reaction occurs, contains skin reacting bodies. If small amounts of such serum are injected into many different areas of the skin of normal persons, these areas may be tested with ingestant and inhalant allergens in twenty-four or more hours Reacting bodies to specific allergens which are present in the serum of the patient can thereby be demonstrated in the skin of the recipient. He must be a person who gives a positive reaction with injected serum containing reacting bodies to a known allergen. False positive and also negative reactions occur and the results of the testing must perforce be checked by clinical trial or confirmed by the therapeutic test. *This method of testing requires careful laboratory technic, and must be reserved for specialists' use in occasional, selected cases.*

Ocular and Nasal Tests.—*Since inhalant allergens give negative skin reactions in 10 to 20 per cent of the patients clinically sensitive to such allergens*, and since the nasobronchial and ocular mucous membranes frequently harbor reacting bodies that are not present in the skin, the dry or liquid extracts of various inhalants, especially of pollens, may be deposited on the palpebral conjunctiva, applied or blown into one nostril, or blown or sprayed into the bronchial tract. Ocular redness and

congestion, symptoms of nasal allergy or of bronchial asthma, according to the site of application, within five to thirty minutes are indicative of specific allergy to the allergen used. This ocular or nasal test at times also is used to determine the clinical activity of various pollens or of other inhalants that have given positive skin reactions.

ALLERGENS AND THEIR PREPARATION

The active substance in inhaled or ingested substances to which a patient becomes sensitized is called an *allergen.* When allergy is established, so-called reacting bodies develop in the body. They attach themselves especially to the cells of the tissues in which the major reactivity arises. The resulting disturbances in cellular structure and function are responsible for the symptoms. These reacting bodies are comparable to but probably not identical with the antibodies and precipitins of immunity. They are present to a greater or less degree in the cells of the entire body, and, in the markedly sensitive patients are found in the blood, as demonstrable by the Prausnitz-Kustner reaction, and in the skin, as evidenced by positive skin reactions. These allergens either are protein in nature or apparently need conjugation with protein to produce sensitization. Evidence indicates that sometimes a carbohydrate is primarily responsible; however, it must unite with a body protein to create the specific allergy. *The union of body protein with simple or complex chemicals which may contact or enter the body* (such as chlorine, arsenic, mercury, dyes, aspirin, sulfanilamide, and many others used in industry and medicine) *explains why allergy to chemicals develops so frequently.* Substances, which in union with a body protein give rise to specific allergic reactivity, are called "*haptens.*"

Skin reactions in sensitized patients may be obtained with foods, with animal emanations, with dusts or other inhaled substances, and at times with drugs. Thus, dry pollens, finely pulverized animal emanations, orris root, pyrethrum, cottonseed, and kapok, or the ground dried foods may be used for testing. The fresh uncooked foods give reactions in many sensitized patients. However, in order to preserve these allergens, and to obtain a concentrated preparation of them, various technics have been evolved by which dry powders containing the specific proteins or reacting substances are prepared or fluid extracts are made. The technic of their preparation is described in current textbooks (see page 250). Much work has been done to obtain allergens in powdered or liquid form which are stable over long periods of time and which give good reactions on the skins of patients who are known to be clinically sensitive to the allergens. Efforts have also been made to get as high a concentration of the reacting substances in the so-called allergen as possible. The fluid extracts of inhalants and foods usually are prepared with glycerin or glucose extracting fluids to which buffered salt solution and a weak preservative are added. Although the glycerin extracts may maintain their activity a little longer than the glucose extracts, the latter have the advantage of not causing so many false skin reactions. *The activity and potency*

of allergens used for skin testing must be assured by their production of positive reactions in the skins of patients who are known to be clinically sensitive to the allergens in question. Since allergens may deteriorate, especially extracted in salt solution, they should be checked every few months.

How Much Skin Testing is Indicated?—Even though skin reactions to inhalants, and especially to foods, may be negative when clinical sensitization is present, and though non-specific or positive reactions occur in the absence of clinical allergy, especially by the intradermal test, *routine skin testing of patients suspected of allergy is very important.* Food allergy, as already stated, which produces definite or immediate symptoms, usually is indicated by good scratch reactions. The more delayed, cumulative, or chronic symptoms from food allergy frequently are associated with negative scratch and less often with negative intradermal tests. Inhalant sensitizations more often are associated with positive scratch, and especially positive intradermal reactions, though negative tests or indefinite reactions occur with both methods, as discussed on page 13 Thus in spite of the fact that the skin test does not yield final information, careful testing with all important foods, animal emanations, a considerable number of miscellaneous inhalants, house dust, spores of important fungi, and important spring, summer, fall, cultivated-flower and tree pollens, as discussed in Chapter III, should be done routinely on most patients.

Patients suspected of food allergy alone should be tested by the scratch method with all important food allergens and with a moderate number of inhalant allergens of all types If reactions to inhalants indicative of unsuspected sensitizations should occur, then complete testing with inhalants by the scratch and checked by the intradermal method is desirable

Skin testing with *group allergens* which contain allergens of closely related foods is not advisable since mild reactions to one or two of those in the mixture used for testing may be missed.

Symptoms suggestive of, or [illegible]
to inhalant allergy as illustrat [illegible]
by elimination diets who la [illegible] developed severe upper left abdominal pain, found to be due to pollen allergy alone. Migraine or recurrent headaches, moreover, which are usually due to food allergy, at times are due to inhalant allergy with or without *food sensitization* as a cause.

Patients suspected of inhalant allergy should be routinely tested with food and inhalant allergens. Complete testing is [illegible]
these ind [illegible] ry in
[illegible] iana-
[illegible] will
[illegible] is not difficult in experienced hands.
when scratch testing, as described on page 24 [illegible]
dermal testing [illegible]
testing wit [illegible]
three hours [illegible]

It must be remembered that *the clinical significance of all positive reactions can only be assured by the production of symptoms in the patient which result from the ingestion or inhalation of the allergenic substance in question.*

Moreover, *when skin testing is not available, many problems of food allergy can be worked out by information obtained from a well-taken history and by the use of elimination diets, as detailed in Chapter V.*

Patch Tests in Contact Allergy.—The characteristics and nature of contact allergy and the use of patch testing in its diagnosis are discussed on page 89.

Diet and Daily Diaries.—An analysis of the patient's accurate daily record of all foods he has eaten, and of his various symptoms, may enable him or his physician to discover specific foods which are responsible for various allergic manifestations. However, unless the patient is eating at home and every ingredient, including condiments, is listed, *these diaries are of questionable value in ascertaining the foods, beverages, or condiments which in minute amounts cause allergy.* When the patient eats away from home he may not recognize traces of milk, butter, wheat, egg, pepper, or spices. These therefore would not be listed in his daily record of ingested foods. Unless these diaries are accurate, the work incurred by their tabulation and the necessary time spent by the physician in their analysis, are hardly justified. A suggested form for the keeping of such a diary will be found on page 213.

Because of the fallibility of such diet diaries the writer does not ask patients to prepare them. He has found that insistence on the strict limitation of the diet only to those foods which are included in the specific elimination diet prescribed allows a more accurate analysis of the effects of certain foods than is possible from diet diaries. *While the patient is taking the elimination diet the physician must interview or hear from him every week or two to make certain that no trace of any food not prescribed is being taken.* The accurate preparation of the meals must be assured. Unwittingly or intentionally, the cook or the patient may include a little forbidden milk, butter, wheat or other cereal flour, pepper, spice, or other food. The patient must realize that a trace of a food to which marked sensitization exists may prevent relief from symptoms if it continues to enter the diet even once or twice a week. A taste of a causative food is justified in the patient's mind by his statement, "I thought that a little bit would not matter." With the milk-free diet, butter substitutes and oleomargarines, all of which contain more milk than does butter, must not be used during the study of possible food allergy. The use of canned soups, commercial and bakery foods such as malted milk, ovaltine, sausage, and other meat mixtures, must be forbidden, since all the ingredients of these products are often impossible to ascertain. The analysis of foods which are eaten in friends' homes and in restaurants is even more important. Without the most careful and intelligent ordering by the patient, small or even large amounts of foods not included in the elimination diet will be eaten. Meals can be obtained which contain

only those foods prescribed for the patiént if he orders or asks for specific foods as detailed on page 139. Thus, rather than have a patient keep a diet diary, the writer has found that it is more helpful and profitable to devote his time to the careful analysis of the patient's meals at home and away therefrom, in order to be assured of the absolute accuracy of the patient's cooperation

A patient's diary of his various activities, his routine of work, his social and recreational engagements, and a record of the various symptoms of possible allergic origin, may be of considerable help in the determination of possible inhalant allergies. From such a diary, the physician can ascertain possible contacts with household allergens (what animals are in and out of doors, what flowers, shrubs, trees, and vines are about the house), and other possible origins of inhalant allergens. When inhalant or contact allergies are suspected as causes of the patient's symptoms the physician must study the [illegible]

[illegible] *difficult problems*

The Determination of Allergenic Foods.—It has been noted in Chapter I that *most patients either fail to react to all foods to which allergy exists or give reactions which are non-specific or which are not associated with any allergic manifestation.* When positive skin reactions are present, their rôle in the production of clinical allergy can be determined only by the feeding of the reacting foods to the symptom-free patient. Definite exaggeration or recurrence of symptoms indicates probable allergy to the added food

The unquestioned decision that a given food causes allergic reactivity often is difficult. Tolerance varies in every individual. In some patients, symptoms may recur immediately in a violent manner from a trace of food, in others they may arise in a few hours or in two or three days, in still others they may not recur until the food has been eaten daily for two or three weeks The tendency for allergic manifestations to recur in cyclic attacks with periods of freedom due to desensitization or refractoriness has been noted on page 55. When the patient gives a definite history of intolerance or idiosyncrasy to individual foods, evidence of allergy to those foods often is easily obtained.

Leucopenic Index.—A few years ago, Vaughan drew attention to the reduction in the white cell count in the blood after the ingestion of a markedly allergenic food. This condition had been reported before especially by French observers Vaughan hoped that information about the possible allergenicity of a food might be obtained through white cell counts before and after the ingestion of the suspected food. However, since the necessary blood counts are time-consuming and fraught with too many possible and technical errors *the routine use of this procedure has been discontinued in the study of possible food sensitizations.* The reduction of the white cell count after the ingestion of foods to which

definite allergy exists is frequent and, as Squire has pointed out, often is associated with an increase in the eosinophilic cells in the blood.

Accelerated Pulse Rate.—Recently Coca has reported acceleration of the pulse rate above a maximum normal level resulting from the ingestion of an allergenic food. The fact that blood-borne allergens primarily produce vascular reactions and that various cardiovascular manifestations of allergy are recognized (see page 130), requires careful consideration and possible confirmation of this diagnostic indication of food allergy by other students.

Eosinophilia and Other Changes in the Blood.—When active allergy to foods, to inhalants, and at times, to bacteria exists, *the granular, red staining, white blood cells (eosinophilic neutrophiles) frequently are increased.* They usually rise from a normal of 1 to 2 per cent to 4 to 10 per cent, though at times 25 to 50 per cent of the white blood cells are eosinophiles. However, a normal count does not rule out allergy. High eosinophilic counts also are found in diseases which are caused by animal parasites and in the necrosing disease of the arteries called periarteritis nodosa. Such eosinophilia may be due to an allergic state in these diseases.

Eosinophilic cells also may be abundant in the tissues which harbor the main allergic reactions. The bronchial and nasal mucosæ may become infiltrated with them in patients with bronchial asthma and with perennial or seasonal hay fever. The gastro-intestinal tissues and the skin contain an excess of these cells when they harbor localized allergy. Thus, the secretions from sensitized tissues may contain eosinophiles, the presence of which offers diagnostic evidence of allergy, as noted on page 107. Whether the eosinophilic cells are due to changes in the tissues themselves or whether they have been attracted to the tissues from the bone marrow through the blood stream is not known, though the latter is the most likely.

The total number of white blood cells often is increased in allergic conditions such as bronchial asthma and gastro-intestinal allergy especially in children. The count may rise to 15,000 or 20,000. The polymorphonuclear cells are never as elevated as when leucocytosis is due to pyogenic infections. The fact that allergy and infection frequently exist together accounts for other changes in the leucocytic count

Studies of the *calcium, phosphorus, potassium, and serum protein content of the blood* in allergic patients have failed to reveal any consistent abnormalities. Allergy itself does not increase the *sedimentation rate.*

Diet Trial.—In order to determine the various allergenic foods which are responsible for the symptoms, *diet trial nearly always is necessary.* The fallibility of skin tests, the limited value of diet diaries, the impossibility of obtaining dependable information from the leucopenic index studies, and the limited help from careful dietary histories have been

can be carried out with the elimination diets. With their use sufficient time for such study can be taken because satisfying menus for regular meals similar to those published herein are possible Nutrition can be protected even with diet trial for long periods if the directions and precautions for the proper intake of proteins, minerals, vitamins, and calories, are followed. These elimination diets offer a standardized method of studying possible food allergy. When they are modified and manipu- [illegible] of food [illegible] *mination* [illegible] *way that blood counts, urine analyses, or X-ray studies are used* The use of any of these tests, of course, does not presuppose that the suspected disease, such as food allergy, appendicitis, nephritis, or diabetes, is present.

Enviromental Control.—When inhalant allergies* are indicated by history or by skin testing, the *control of the environment in the home, at work, or in recreational areas, may relieve the patient of his symptoms.* Often hyposensitization, as described on page 38, also is necessary. If when inhalant sensitizations are suspected, a partial control of the environment and the indicated hyposensitization therapy do not produce the desired relief, the patient may be placed in a room in which strict control of the air-borne allergens is assured This procedure may be used as a diagnostic therapeutic measure. Brief directions are found on page 204.

Strict environmental control can be established in the hospital and in most homes. Carpets should be replaced by washable throw [illegible] Ordinary [illegible] requi [illegible] The f [illegible] paint, furniture polishes, and floor cleaners or waxes may cause or activate allergy in certain patients must be kept in mind Overstuffed furniture should be replaced by wooden, iron, or wicker furniture without cushions. The mattress and [illegible] covered [illegible] may be folded several times and pinned together Over these slips, several sheets, pillow slips, cotton pads, or towels should be placed to diminish the discomfort from sleeping on non-absorbable or rubberized material A box spring should be encased with a dust-proof slip or replaced by an open spring mattress Bedding should be well-washed cotton, or if the patient is not wool-sensitive, old, well-washed woolen blankets, free of the fuzz of newness. No comforters

* For protection against dusts in various [illegible] there are many respirators which fit over [illegible] Pr [illegible] are advisable. The Willson O [illegible] d, Indiana, and the American [illegible] Cloth is a light Chinese [illegible] it is sticky and gumm [illegible] patient The Exp [illegible] Allergen Produc [illegible] fabric. Ready-m [illegible]

(cotton, woolen, or feather) should be used since they throw off fine dust to which allergy may exist. Shades on the windows should be wiped free of dust. Draperies and curtains should be thoroughly washed or cleaned. Finally, the ceiling, walls, floors, woodwork, furniture, window frames, and the frame and springs of the bed should be wiped and cleaned thoroughly with damp cloths so that the dust is not brushed into the air. The floors and woodwork should be cleaned every day with damp cloths. *Closets adjoining the room should be closed tightly or emptied of clothes* and dust-producing materials.

To prevent dust from adjoining rooms or halls from blowing into the patient's room, the doors must be closed. The edges of the doors may be sealed with weather strips or with paper pasted thereon. *All* flowers, animals, perfumes and clothes should be kept out of the room. Friends and relatives should not remain long until relief has occurred. They should wear no fur or woolen coats or dusty clothes while they are in the room. Smoking and the use of cosmetics should be prohibited. As improvement occurs, the patient may use allergin-free cosmetics, though even these may secondarily initiate an underlying allergy or may contain substances to which occasional allergy arises. At times, the cosmetics or clothing of nurses or relatives produce allergy in the patient. Silk-sensitive patients may react to the allergens from silk stockings or from clothing worn by nurses or friends. If the patient is pollen-sensitive or *lives in an area where much suspended dust is present in the air,* an efficient pollen filter, such as the improved one of the Carrier Corporation, should be installed in the window to insure dust- and pollen-free air in the room. This precaution is important especially if the patient lives in the country where pollens are abundant or if the patient who is allergic to animals or feed dust lives near barns or animal yards. Vines growing around the patient's windows, shrubs and flowers in the garden near the room, birds roosting or nesting in the roof, or in vines or shrubs near the house, animal emanations, spores of molds, and other dusts from adjoining roofs or yards may yield air-borne allergens which blow into the patient's room.

To study the effect of environmental control on presumed inhalant allergy, the patient should remain in such a room for a minimum of five days. If relief is evident, the diagnosis of inhalant allergy may be confirmed and further study and indicated therapy will gradually bring to light the various causative inhalant allergens and produce necessary hyposensitization. For a period of weeks or months the patient may be required to spend varying amounts of time in this room and may even have to sleep in it. Moreover, strict or modified environmental control may be necessary in a sitting room and, later, in the patient's working environment or office. In addition the frequent cleaning of the interior of the patient's automobile may be necessary, especially if animal emanations or house dust allergy is present.

THERAPEUTIC RESULTS IN DIAGNOSIS

The final decision regarding the various causes of allergic symptoms can be made only after the results of the elimination of the allergens and hyposensitization with properly prepared extracts or antigens containing those allergens are ascertained. Therefore, to reach a conclusion may require days, weeks and even months, depending on the degree and number of allergies which affect the individual patient. *In food-sensitive patients, the initial object of the study is to produce a symptom-free period which is definitely longer than those which have previously occurred.* When the patient or his parents are certain that unquestioned relief has been established, the various foods may be added at one- to two-week intervals, as suggested in Chapter V. Gradually the foods responsible in varying degrees for the symptoms can be ascertained. Since with the elimination of foods hyposensitization or increased tolerance occurs with varying speed and frequency, the reinstatement of a formerly allergenic food in the diet may not be associated with symptoms, though they may arise if allergy again evidences itself at a later date. Likewise, *the causes of inhalant, contactant, and the less frequent bacterial allergies must be determined gradually through the careful analysis of protection against such allergens and of subsequent exposure to them when the patient is symptom-free, and finally* [illegible] determination of all the allergenic causes of many allergic manifestations requires the intelligent and understanding cooperation and analysis of the patient and the evaluation of well-directed and adequate therapy by the physician, at times over a period of months or even of several years. Adequate or nearly complete relief [illegible] dec [illegible] ma [illegible] ma [illegible] Therefore, it is evident that diagnosis of the allergenic causes, as does much medical diagnosis in a varying degree, depends on the results of therapy.

CHAPTER III

CAUSES OF ALLERGY AND THEIR CONTROL

Allergy may arise to most substances with which the body tissues have contact through ingestion, through inhalation, through contact with the skin, and through absorption from foci of infection or acute infections, from products of diseased tissues, or from medicaments. Allergy due to ingested inhaled, or injected substances or from foci of infection or diseased tissues is caused by allergens which enter the blood and are carried by the blood stream all over the body. These allergens sensitize every cell in the body in varying degrees, but the maximum degree of allergy is in the cells of the so-called shock tissues. *Those tissues which are predisposed to develop allergy through some natural cause, especially through inheritance, are more highly sensitized than others.* When the substance is ingested, inhaled, or absorbed, the allergic reaction in these tissues is so great that cellular changes arise which produce symptoms. Thus patients may have one or more of the ordinary or of the less common manifestations of allergy such as bronchial asthma, hay fever, perennial nasal allergy, eczema, urticaria, migraine or gastro-intestinal symptoms, as described in Chapter IV, depending upon whether the concentration of the reacting bodies is sufficient to produce tissue disturbances. It may well be that allergy primarily affects the cells of the blood-vessels and especially those of the capillaries, and that sensitization of the adjoining tissue cells develops thereafter. That every cell in the body is sensitized more or less is evidenced in a patient suffering with hay fever or asthma who develops a so-called general reaction when an excessive dose of the allergen is injected. A discussion of these reactions is given on page 41. *Contact allergy contrasted with the types previously discussed is dependent on reacting bodies in the superficial cells of the skin and possibly in mucous membranes.* This subject will be further discussed on page 88.

The various allergens which are known to produce clinical symptoms are grouped in the following tabulation. They will be discussed in the remainder of this chapter.

1. *Inhalants*

Pollens	Hay and feed dusts
Animal and bird emanations	House dusts
Silk	Occupational dusts
Orris root	Recreational dusts
Cosmetics	Flours and dusts from other foods
Pyrethrum	Drugs and medicaments
Derris root	Fly and insect emanations
Flaxseed	Spores of fungi and smuts
Kapok	Tobacco
Cottonseed	Chemical inhalants
Glue	

2 *Ingestants*
  Foods
  Beverages
  Condiments
  Drugs
  Water (mineral and organic contents)
  Dyes

3. *Contactants*
  Environmental
  Medicinal
  Occupational
  Cosmetic

4 *Infectants including bacteria, parasites and fungi. Products of diseased tissues*

5 *Insect and snake bites*

6 *Injectants*
  (*a*) Subcutaneous or intramuscular
    Sera
    Drugs
    Hormones
    Allergens
    Vaccines
    Snake and bee venom
    Catgut
    Silk sutures
  (*b*) Intravenous
    Sera
    Drugs
    Allergens
    Vaccines
    Foods (through transfusion)
  (*c*) Rectally
    Drugs
    Foods
  (*d*) Nasal, aural sinus, vaginal, urological, intrabronchial, cerebrospinal injections of drugs, sera or allergens

7. *Physical allergy*
  Either primary or secondary in action

INHALANT ALLERGENS

Pollens.—*Pollens are the most common inhalants that cause allergy.* They most frequently produce seasonal nasal allergy or hay fever, seasonal and at times chronic bronchitis or bronchial asthma, seasonal ocular allergy and atopic dermatitis or eczema. Recurrent headache or migraine, allergic toxæmia and gastro-intestinal symptoms may also arise from pollen allergy. Being the germinal and vital elements of the flower and rich in protein, pollens readily produce sensitization.

The morphology or shape of distantly related pollens is dissimilar. Each pollen is quite constant in size and shape and closely related species are nearly identical. The features and characteristics of pollens have been studied especially by Wodehouse. Those of a number of important pollens are given in Table 1. Pollen grains have definite morphology. Those of closely related species and genuses are similar in appearance and their size from 6 to 12 μ ($\frac{1}{1000}$ mm)

Pollens from inconspicuous wind-pollinated flowers are so light that they are [illegible]
blown fo[illegible]
other ma[illegible]

spores of ungi, smuts, and bacteriæ are found in the air at an elevation of 15,000 feet or higher. They even have been found in the air over the Greenland ice cap. *Pollens in the air may be counted* by determining microscopically the number in 1 sq. cm. of a glass slide covered with a thin layer of vaseline of glycerin jelly, after the slide has been exposed out-of-doors for a twenty-four-hour period. Since the morphological characteristics of pollens are known, as indicated in Table 1, the pollens

Table 1.—Morphology of Certain Allergy-producing Pollen Grains

	Shape	*Type*	*Average size* (μ)
I. Shrubs, grasses and weeds:			
A. Echinate . . . . . (Probably all Compositæ except Artemisia)	1. Spherical	Ambrosia	16–25
		Franseria	18–23
		Xanthium	22–29
		Iva	25
		Helianthus	38
	2. Ellipsoidal	*Hemizonia*	*38–29*
B. Smooth	1. Ellipsoidal (Polyhedric)	Artemisia	18–28
		Urticaceæ	12–25
		Ricinus	33–46
	2. Spherical	*Plantago*	*34*
	3 Polyhedric	Gramineæ	28–55
C. Punctate, with furrows	....	Brassica	25–46
D. With bands .	1. Ellipsoidal	Rumex	22–32
E. With distinct pores	*1. Spherical*	*Amaranthus*	*23–30*
F. With less distinct pores	1. Spherical	Atriplex	29
		Chenopodium	29
		Salicornia	29
G. Four grains held together .	...	Typhaceæ	18–26
II. Trees:			
A. Punctate	1. Spherical	Populus	29
	2 Ellipsoidal	Garryaceæ	38
B. Three-lobed . . .	1. Smooth		
	a. Blunt ends	Fagaceæ	25–40
		Plantanaceæ	17–25
		Oleaceæ	*21–33*
	b Less blunt	Aceraceæ	28–36
	c. Pointed ends (one groove)	Palmaceæ	13–25
	2. Punctate	Salix	18–29
C. Hemispherical . .	. .	Juglandaceæ	30–48
D. Two-winged . .	1 Reticulate	Pinaceæ	45–65
E. Polyhedric . .	1. Smooth	Betulaceæ	20–40
		Cupressaceæ	32
F. Triangular . . .	1. Smooth	Eucalyptus	25
G. Gridiron	1 Spherical	Acacia	48–55

can be counted and identified. *Pollen counts vary in every area, in regard not only to variety* but also numbers. After the frosts, and with snow on the ground, the pollen rapidly disappears from the air. In the months from spring to fall rain temporarily reduces or eliminates the pollens, but the moisture especially when it is associated with sunny days, is conducive to abundant pollination. In California, whenever the sun is shining pollen is in the air. *Tree pollens are most abundant from Feb-*

ruary to May, grass pollens from April to July and the amaranth, atriplex, ambrosia, Russian thistle, artemisia, and franseria pollens from July to November. Maximum pollen counts in California are not much greater than 400 to 500, they are less in the cities than in the country, and are minimal in cities along the coast. In the Middle West and East where ragweed is the main fall-pollen producer, counts may rise to 4000 or more. Allergists are able with frequent pollen counts or with counts on air near a patient's home to determine the predominant pollens or some specific environmental pollens which need special consideration in therapy.

Pollens of insect-pollinated trees, shrubs, and flowers are not as important causes of allergy as the wind-borne pollens. However, patients may become sensitized, especially if they live in close proximity to them. Flowers, shrubs, and trees around the house or in nearby yards may throw pollens which are blown for 50 or even 200 feet. Thus patients in the yards, in the street, or in the house may inhale these pollens. Flowers in the house also may be responsible for allergic reactivity. Therefore patients should be skin-tested with all important insect-borne pollens to which they are exposed.

A knowledge of the pollens which are in the air of the patient's environment is essential for successful therapy. With the aid of botanists, surveys of most areas of the United States and of certain other areas in the world have been made which include all of the pollen-producing [illegible]

[illegible] The physician must know not only the flora of the immediate area, but also that of distant regions, even 200 or more miles away, from which pollen-carrying winds blow toward the patient's residence. A knowledge of the shrubs, flowers, and trees around the patient's home is also necessary in many cases. Since the pollens, and as we will learn later, the spores of fungi from various grain-and-farm products grown around a country home may produce marked and specific allergy, the physician's inquiry and survey should list all these. Furthermore pollens from the air may settle on the walls, curtains and carpets so that the house dust may contain enough pollen to keep pollen allergy active throughout the winter.

Pollens are gathered by specially trained workers from the blooms of the grasses, shrubs, weeds, trees, and cultivated flowers. Just as the blooms are about to yield pollen they are collected in large numbers. The stems may be placed in low jars containing [illegible]

[illegible] glass or paper. It then [illegible] with a small camel-hair brush or razor blade. The blooms which contain abundant pollen, such as those of the artemisias and ambrosias, may be pounded or rolled in the dried state. The pollen and dust obtained is passed through a fine sieve several times to get as pure

pollen as possible. It usually must be cleaned by passing it through a 200-mesh screen. It is dried over calcium chloride, defatted with ether, and stored in air-tight bottles. The allergist should have pollens from nearby as well as from distant areas. From 100 to 200 pollens may be necessary for possible testing.

Evidence is increasing that certain active substances as discussed on page 59, are specific for each pollen. Closely related species such as grasses probably contain allergens common to all grasses and also species-specific allergens found only in the single grass pollen. *These group and species-specific allergens* are found in other closely related pollens such as artemisia, ambrosia, or franseria. This specificity of pollen allergens demands that the physician know the various species of grasses, weeds, trees, and flowers in the environment of the patient and that extracts of the pollen of such species be included in the antigens prepared for the patient's treatment if the best results are to be obtained.

Method of Extraction.—Pollens are extracted with solutions of weak alkali or sodium chloride which contain 35 to 50 per cent glycerin, or with a 5 per cent glucose solution to which 0.4 per cent phenol has been added. The extracts made with salt solution alone are not as stable as these. Usually 2 or 3 per cent extracts are prepared, though some allergists maintain that all the active substance is extracted when 5 per cent or even 10 per cent preparations are made. The physician may include 10 or even 30 different pollen extracts in one bottle, or he may prepare several bottles of antigen for each patient, each containing 1 to 5 pollen extracts. *The amount of each pollen in the antigen depends on the importance of the pollen in the patient's problem as determined by history, skin testing, and the amount of the pollen in the patient's territory.* Since the degree of clinical sensitization is not necessarily indicated by the size of the skin reaction and since about 10 per cent of patients fail to react to any or all of the causative pollens, it usually is wise to include all of the important pollens to which the patient is exposed. The amounts of individual pollens should depend on their local importance and on the probable degree of the patient's specific allergy thereto. If a 2 per cent stock extract of pollens is used, this 1 to 50 preparation is diluted to 1 to 500 and 1 to 5000 strengths. In very sensitive patients, initial treatment may require a 1 to 50,000 or a weaker dilution.

Pollen Units.—The usual unit of pollen allergen is the so-called Noon unit, according to which 1 unit is the amount of allergen in $\frac{1}{1,000,000}$ gram of dry pollen. Various students have standardized pollen extracts by total nitrogen or total protein nitrogen determinations. Equivalent amounts of these different preparations are given on page 218. Standardization of pollen extracts by weight seems best when the extracts are to be used therapeutically.

Treatment.—*Treatment must be started with 0.05 or 0.1 cc. of a dilution which fails to react by the scratch test and which does not produce or exaggerate symptoms.* It is rarely possible to start with a less dilute extract than a 1 to 5000 dilution, and often a 1 to 50,000 or even a 1 to 50,000,000

dilution must be used. Weak extracts are required especially if only one or two pollens are combined in the antigen, if the patient is extremely sensitive and if treatment is being given during the season when the greatest amount of pollen is in the air. The air-borne pollen plus that which is injected may exceed the patient's tolerance and give rise to increased symptoms. *At no time during therapy should symptoms be increased or re-established by pollen therapy.* Routine directions and fast and slow schedules for pollen administration are given on page 210.

Three plans of pollen therapy are available: 1. *The pre-seasonal therapy* may be instituted three or four months before the pollen season begins. ... days and a dose of 0.60 to ... be ... -po- sensitization already attained may not prevent symptoms which arise from the increasing pollen in the air. A reduction in dosage to 0.10 to 0.40 cc. of the 1 to 50 dilution every few days or to smaller doses, as described under co-seasonal therapy, may be necessary, or the treatment may be discontinued until the following year.

2. *Perennial therapy is favored by many allergists.* Treatment may be started at any time of the year. If it is begun during the season small doses should be used The maximum doses may be repeated at seven- to fourteen-day intervals throughout the year with more frequent and possibly smaller doses being given during the pollination seasons accord- ... two or more ... to the pol- ... ly finally be able to tolerate the maximum doses even during the pollen seasons. This perennial therapy offers more likelihood of eventual freedom from clinical symptoms without continued hyposensitization therapy than pre-seasonal treatment alone. However, the pollen antigen may have to be changed from time to time since new pollen allergies may arise, either to pollens formerly unproductive of allergy or to new pollens encountered in areas more frequently visited. As in all allergic therapy, absolute and prolonged cooperation of the patient with his intelligent understanding of the problem confronted by the physician is imperative.

3 *Co-seasonal therapy is necessary for the control of symptoms which arise during the pollen season.* With small doses of the antigen the symptoms may be controlled provided the specific pollens to which the patient is exposed are included These doses may vary from 0.10 cc. of a 1 to 500 to 0 10 cc. of a 1 to 500,000 or may be more dilute according to the number of pollens in the antigen and to the degree of sensitization. In very sensitive patients, a 1 to 5 million or a weaker dilution may be required. Injections may be given every one to three days for one to three weeks As symptoms disappear, the doses may be increased and given less frequently.

The duration of pollen therapy, as already stated, depends on the degree of sensitization, the number of pollens to which allergy exists, and the

persistence of the hyposensitization which therapy creates. The doses which are required and tolerated vary with each patient. Unfortunately, some patients must receive a varying amount of treatment for several years. Some may need protection for an indefinite period in the same way that diabetics require insulin therapy throughout life.

RESULTS FROM POLLEN TREATMENT

The writer agrees with the conclusion of Vaughan, Tuft and others that from 80 to 90 per cent of pollen sensitive patients are completely or satisfactorily relieved with proper therapy. Better results are obtained with perennial than with preseasonal therapy. Both usually require reduced doses during the pollen season as discussed above under coseasonal treatment. A moderate number of patients maintain their hyposensitization after one to three years of therapy so that no treatment is required for several or more years. Occasionally a patient seems permanently relieved.

Good results in bronchial asthma and especially in atopic dermatitis due to pollen allergy usually require smaller doses than are tolerated in pollen hay fever. During the season, especially, minute doses every two or three days as advised in the discussion of co-seasonal therapy may be necessary. Self administration of such doses often is advisable. At no time must the injection intensify the manifestation. As improvement occurs, especially after the pollen season, doses can be increased as rapidly and to as large an amount as tolerance will permit.

Self-administration of Pollen Antigens.—This is justifiable under the following conditions: *If small daily doses are indicated* during coseasonal treatment, and if the physician has determined that no undesirable local or general reactions result, the patient may administer the required amount himself. *Perennial therapy at regular intervals with the same amount of antigen*, which has been found to produce no unfavorable reactions, may also be administered by the patient himself. If the patient's work prevents regular visits to the doctor's office, or if he lives many miles away from the nearest physician, he also may administer the antigens himself. He should report to the physician at regular intervals either by mail or in person and should not be given all dilutions of the antigen at a time so that the possibility of a general reaction is decreased. Whenever self-administration of any antigen is allowed, the physician must instruct the patient or other person who is to give the injections so that the syringe will be sterilized correctly, the antigen will be measured accurately in a tuberculin syringe, the skin will be cleaned and disinfected properly, and the injection will be given subcutaneously in an area free from underlying large veins. The patient must be provided with a schedule of doses so that a proper increase can be made, providing local reactions are not larger than 2 inches in diameter within twelve hours after injection and general reactions and exaggeration or reactivation of symptoms do not occur. When the patient is administering the

antigens, the dilutions should be so weak and the increase so slow that constitutional reactions are unlikely. The control of general reactions is described later. *Self-administration of antigens, therefore, is justifiable only under the circumstances described and when the physician has given the proper instructions.*

General Reactions and Their Control.—Whether pollen therapy is administered by the physician or by the patient himself, the patient should be taught to recognize indications of too large doses of antigen and the symptoms of the so-called general reaction. Increased congestion and watering of the eyes and nose, sneezing, coughing, tightness and wheezing in the chest and asthma may develop within a few minutes to one hour after the injection according to the degree of the patient's pollen allergy. Cutaneous symptoms also may arise, including puffiness of the eyes and face, redness, itching and hives and swellings of varying areas of the body. With severe reactions, abdominal cramping and pain, and even bladder spasm and involuntary urination may occur. These reactions are most common during the pollen season. Therefore the doses of antigen must be increased cautiously and frequently must be reduced, as described in co-seasonal therapy. When pollen therapy is carefully regulated, the likelihood of general reactions is greatly diminished They are more apt to occur during the first year of treatment, in very sensitive patients After an injection, the patient must wait in the physician's office from a few minutes to fifteen or thirty minutes according to his susceptibility *If any indications of a general reaction arise, the physician should give from 0.1 to 0.8 cc. of 1 to 1000 epinephrine solution subcutaneously according to the degree of reaction and the age of the patient* This dose must be repeated every five to sixty minutes until relief persists. With severe reactions, administration of epinephrine may be necessary several times during twenty-four hours. If the reaction is severe it may be lessened and the speed of the antigen absorption may be retarded by placing a tourniquet above the site of the injection and releasing it for one minute every four to five minutes over a period of twenty to thirty minutes. During pollen therapy, the patient may carry 6 capsules containing ⅜ grain of ephedrine in his pocket. If a reaction develops after he has left the physician's office, he should take 1 or 2 capsules by mouth and immediately return to the physician for further epinephrine therapy.

When self-administration of pollen antigens is indicated, the patient must be instructed about possible general reactions, he must be provided with ampules of 1 to 1000 epinephrine and he must be instructed about the proper dose and its administration For one-half hour or so after an injection of antigen, the patient should remain at home where he can take the epinephrine hypodermically if a general reaction develops.

These reactions are much less common than they were several years ago since now treatment is started with small doses which do not cause any exaggeration of symptoms. Moreover, the doses must be increased according to a careful plan, and must be reduced if undue local or general

reactivity arises. At no time should pollen therapy exaggerate or reproduce the symptoms.

Oral Pollen Therapy.—Oral pollen therapy was first discussed by Black in 1927. It has been tried with varying success by other allergists since then. At present the consensus is that it benefits some patients but that the injection method gives better results.

Ilie and Gay in 1942 used initial preseasonal doses of from 0.5 mg. to 8 mg. (0.001 mg. = 1 noon unit) of dry pollen with starch in capsules depending on the degree of sensitization and the amount of previous pollen hyposensitization. Maximum doses of from 60 to 120 mg. of dry pollen were given. Preseasonal treatment was ordered 2 to 3 times a week after meals. When treatment was started during the season, doses were given 1 or more times a day depending on the patient's tolerance. Mild gastro-intestinal symptoms often arose from the oral pollen therapy and occasionally urticaria, localized itching, redness, or swelling of the skin, or mild sneezing or itching of the nose arose. Of interest is the statement of Rappaport, Zeller, and Padnos that the results of their oral pollen therapy and of placebo therapy were comparable. At present, therefore, oral therapy must be reserved for the rare patient who refuses injectant therapy given by the physician or self administered under the physician's direction.

ANIMAL EMANATIONS

The dander from animals which consists of the cutaneous scales and of the small amounts of dust and particles from hair may produce allergy in man. *Patients become sensitive to those emanations to which they are most frequently exposed.* They may be either from the live animals or from hair in carpets, upholstery and bedding in the home, in places of recreation, at work, or in automobiles. A record of all information concerning such contact is an important part of the patient's environmental history. Allergy to the emanations of *horses, cows, cats, and dogs* is most common because of the predominance of these animals in the living environments of men. Cats and dogs in adjoining yards may give off emanations which blow into the home. The emanations of animals brought into the home on the clothes of relatives or friends are a definite source of trouble. The use of horse hair in mattresses and upholstery, the use of cattle hair in pads under carpets and in upholstery must be remembered. Patients become so sensitive to the emanations of horses, cats and dogs that symptoms arise when they merely enter a house in which emanations are. The presence of cats or dogs in the basement or in one room may result in the presence of enough allergens in other parts of the house to affect the very sensitive patient. Their presence in houses years before may have left traces of emanations which cause such difficulty. Horses, far distant from a house, perhaps in a field past which the sensitive patient rides in an automobile, may cause allergic symptoms. *Wool allergy* is most severe in those who raise and handle

sheep and who sell or prepare the crude wool for the markets or for the manufacture of yarn. It also occurs from the dust of woolen blankets, of fabrics, and especially of carpets. Therefore wool allergy demands environmental elimination and often hyposensitization therapy. *Goat hair* in mohair fabrics and *camel* and other hairs in garments, furniture and floor coverings give rise to allergy. Those who work with *wild animals in zoos and in circuses* often are sensitized to animal emanations. Hunters sensitized to *deer or other game* dander may be affected when they carry or handle the actual game or ride in automobiles or are in homes where the skins or stuffed heads or animals have been. Allergy to rodents such as *mice, rats, marmots, squirrels, rabbits,* or similar animals develop according to the frequency and degree of exposure. *Rabbit hair* is utilized in furs, clothes, shoes, slippers, gloves, muffs, robes, trimmings, rugs and [illegible] in pillows, bedding, quilts and [illegible]

in infant's wear, gloves, hosiery and underwear. *Laboratory workers* who inhale the emanations of mice, guinea pigs, rabbits, monkeys, dogs, or cats may become sensitized. Sensitization to the *furs* of various animals sold commercially occurs Inhalant sensitizations to the dusts given off by them, however, are not as common as are contact reactions on the skin. This form of dermatitis is most frequently due to the dyes and chemicals which are used in the curing and manufacturing of the furs. The processing eliminates nearly all the contained dusts.

Allergy to the dust and emanations from birds is common. Those who raise poultry and birds of all types may develop sensitivity to specific ones. Sensitization to *canaries or parrots* or to the dust from stuffed birds develops with varying frequency. The emanations from canaries may blow through the house from the room in which the birds are or from an aviary in the yard. Emanations from birds roosting or nesting in vines or trees near bedroom windows or on roofs or eaves of the house may cause allergy Sensitization to *feathers* is frequent because of their use in pillows, upholstery, comforters, and mattresses. When this allergy occurs the removal of all sources from the patient's environment is important The pillows and mattresses used by the patient may be covered with allergen-proof slips or covers, or the removal of such pillows and mattresses from the house may be necessary. The thorough cleaning of the living environments as discussed on page 31, is most necessary.

Allergy to fly and insect emanations is discussed on page 49.

Hyposensitization with all specific allergens suspected may be carried out as with pollens (page 38)

SILK

Silk sensitization arises at all ages and is often associated with a high degree of allergy as evidenced by a large scratch reaction. The frequency of inhalant allergy in those raising silk worms and in those gathering cocoons and in spinners of silk fiber is not known. Dermatitis in silk

handlers, however, has been described for several centuries. The highly allergic individuals may have severe nasobronchial symptoms or dermatitis from the inhalation of the traces of silk allergen in the air of a room in which silk curtains or other silk fabrics are, or in which women who are wearing silk have been or are present. Silk underwear or bedclothes or silk in the dust of rooms must be suspected in silk-sensitive patients One girl with a generalized dermatitis all over the body, even in the scalp, associated with severe pruritus, was gradually relieved when all silk furnishings and clothing, including stockings, were removed from her [illegible]
mi [illegible]
of [illegible]
degree.

ORRIS ROOT, KARAYA GUM AND OTHER INGREDIENTS OF COSMETICS

Orris root powder made from dried iris bulbs is light in weight, has a delicate odor, and is used in certain face powders. It is used also for dry shampoos. Varying degrees of nasal and bronchial allergy arise from its inhalation and a hive-like dermatitis may develop from face powder or cosmetic containing it. From the slightest inhalation severe allergy may arise causing profuse coryza, sneezing, nasal blocking, ocular congestion, allergic bronchitis or bronchial asthma. One patient was unable to go into theaters or homes where powders containing orris root were in use until hyposensitization was accomplished. Sensitizations to new ingredients may arise as shown by the case of the hairdresser who first had nasal allergy to orris root and later to rye and rice flours which were used to dry shampoo the hair. *Rice powder, dyes, various perfumes, and sometimes other ingredients in powders and cosmetics* also give rise to nasobronchial and cutaneous allergic manifestations. Contact allergy to the dyes and other ingredients in lipsticks causes eruptions on the lips known as cheilitis. In susceptible individuals patch tests on the skin with various preparations reveal those to which allergy exists. Rouges, mascara, and various eyelash and eyebrow dyes also may produce eruptions, or at times conjunctival inflammation and even corneal ulceration.

Various ingredients in hair setting solutions not only cause eruptions in the scalp and the skin of the neck and face, and on the hands of the operator, but also nasal and bronchial allergy in the patron and in the operator. *Karaya gum* (see page 87), which is so frequently in solutions for the hair, dries on the hair and scalp and its dust often produces inhalant allergy. One operator who had severe sneezing and watering of the nose from the dried karaya gum in the hair and in the air of her salon was successfully hyposensitized. *Acacia (gum arabic), gum tragacanth, linseed gum and quince seed gum* which are used in such preparations may also give rise to allergy. One case of asthma from the inhalation of acacia dust in a factory has been reported.

PYRETHRUM AND DERRIS ROOT

Pyrethrum is composed of powdered leaves of a daisy closely related to the chrysanthemum. It is commonly used as an insect powder or insecticide and gives rise to nasobronchial and cutaneous allergies of varying severities. Carpets and rugs during manufacture and when they are demothed frequently are sprayed with it, and furniture in public places including theater seats often receive such an application. One patient is recorded by Piness who had a fatal attack of asthma from the inhalation of pyrethrum in the air of a theater. Most commercial fly sprays contain pyrethrum.

Allergy to *derris root* which is used in insecticides also has been described Therefc~e it is advisable to use it in skin testing.

GLUE

The inhalation of glue dust may produce nasobronchial and cutaneous allergy which at times is extremely severe. Skin reactions by the scratch test may be large, intradermal tests should never be done if positive scratch tests are obtained. These patients are so sensitive that the glue dust in the air of offices, libraries and homes where there are books and furniture which have had glue used in their manufacture will cause difficulty.

Glue, which is made of fish or mammalian skin, bones, or cartilage, produces severe clinical allergy Some evidence indicates that glue allergy is always due to fish glue Such allergy usually but not necessarily is associated with allergy to the meats of fishes. Extremely severe and even fatal symptoms have been described by Duke and Stofer, Cooke and others to infinitesimal amounts of glue, even to that used in scratch testing When hyposensitization therapy is given, extremely dilute solutions must be injected One of the writer's patients was given first a 1 to 500,000,000 dilution with a very careful increase over a period of four years. His generalized and severe dermatitis which had prevented sleep for many months and had incapacitated him for over two years was gradually controlled

Glue is used by cabinet workers, carpenters, on envelope flaps, in the making of pads and books, on sandpaper and matches, *tablets*, gummed paper, courtplaster, in sizing cloth, paper and carpets, in gelatin, jellies, isinglass, combs, buttons, mucilages, and pastes The dust of furniture and books in homes, offices, drafting rooms, and libraries contains varying amounts of glue Severe reactions from absorption from the glue used on the inner sole of shoes have been reported. The licking of stamps and labels may cause severe reactions in the lips and mouth or on distant tissues Most stamps, however, are treated with a vegetable glue.

COTTONSEED AND KAPOK

Cottonseed allergen produces [illegible]
that the dust f [illegible]
and even the r [illegible]

nasobronchial, ocular, and cutaneous manifestations. Cottonseed meal in fowl and cattle feeds is especially deleterious if it is inhaled by a sensitized person. Cottonseed allergy must be considered in workers in cotton fields, in those engaged in cottonseed oil mills and in others who contact this product in the industries. *Allergy to the liquid and* hydrogenated oils will be discussed under Ingestants.

Kapok allergen in the dust of the seeds and of the floss also causes allergic manifestations. Those patients who are sensitized either to cottonseed or to kapok may or may not be allergic to the allergens of both of them. Allergens common to both and specific for each explain such individual or common reactivity. The large pods of the kapok tree contain the silky floss so commonly used in pillows, mattresses and upholstery, contains varying amounts of the sensitizing allergens. This floss pulverizes with age and often sensitizes patients who are exposed. *Rackemann has reported that there probably is as much kapok and cottonseed allergy as feather allergy.* The use of allergen-proof covers or of other non-allergenic materials for sensitized patients is discussed on page 31. The gradual development of new allergens in ageing kapok and cotton linters will be discussed in the next paragraph.

HOUSE DUSTS

House dust sensitizations which originally were reported by Cooke and Kern have been recognized for twenty years as causes of nasobronchial, ocular, and cutaneous allergies Certain investigators have held that an unknown allergen in house dust is responsible for much of the allergy. Credence is lent to this idea by the recent discovery of Cohen that such an allergen exists in kapok or cotton linters aged in tight jars which had been autoclaved at a high temperature. However, house dusts also contain many allergens from carpets, pads, upholstery, glue, wall paper, clothes, cosmetics, animals, pollens, insecticides and from many other obvious sources The ingredients of course, vary with each home. The dusts of hotels, theaters, and public places also give rise to allergy and their varying content of allergens is obvious. Sensitive patients who inhale them usually give reactions to one or more stock house dust extracts by the scratch and especially by the intradermal tests When reactions, particularly to animal emanations, kapok, cottonseed, orris root, pyrethrum, silk, pollens or other miscellaneous allergens are at all marked, the control of the specific allergies often will make hyposensitization with dust extracts unnecessary. Moreover, environmental control as described on page 31, is important in such patients.

When house dust hyposensitization is indicated, *the treatment with autogenous dust extracts from the patient's living environments is more desirable than with stock dust extracts.* The dust may be taken from the bag of a vacuum cleaner after the cleaning of all the carpets, overstuffed furniture and mattresses, or separate specimens of dust from single rooms, special carpets, pieces of furniture or mattresses may be obtained. After

extracts are made, skin testing usually indicates the degree of allergy, and treatment with single or combined extracts can be given. A marked reaction to the dust of one room or carpet or piece of furniture may lead to the discovery of the major or of one important source of inhalant [illegible] associated [illegible] *reactions in the absence of scratch reactions to house dust extracts is [illegible] questionable.* Moreover, small or negative reactions may be associated with definite clinical allergy.

OCCUPATIONAL AND RECREATIONAL DUSTS

Sensitization to the allergens in the dusts of any environment frequented by the patient, is of course possible. As in other inhalant allergy, nasobronchial, ocular, and cutaneous manifestations are the common results Occasionally gastro-intestinal allergy, allergic toxemia, and migraine or other central nervous system allergy may arise, as described on pages 35, 125 *Every office, professional, mercantile, industrial, or out-of-door occupation* obviously exposes the individual to various air-borne and contact allergens which should be recognized and studied in the patient whose problem is difficult to understand and to control. Likewise, *recreations*, be they golf, tennis, hunting, hiking, gardening, botanizing, woodworking, photography, or any other, offer specific challenges from the allergic viewpoint. Tests with specially obtained or prepared inhalant allergens or substances productive of possible contact sensitization, must be carried out.

FEED, HAY, AND GRAIN DUSTS

Individuals who are around farms and those who work in barns in which animals or fowl are fed may become sensitized to the dusts of hay, grain and other feeds, especially those who are prone to develop inhalant allergies to pollens or to animal emanations *The kind of hay varies in every area* For instance, *timothy, red top, orchard grass*, and clover, commonly are cultivated where winters are cold; *oats and barley* are grown in the warmer regions, *alfalfa* which is raised where irrigation is available is a common cause of allergy Hay dust, itself, contains allergens other than pollens to which allergy develops The resins of grasses and of weeds, as discussed on page 80, may give rise to contact allergy. T[illegible] extracts of various hays are advisable for routine testing of patients exposed to hay, and extracts of various hays from the patient's own barn or stacks may be useful

Allergy to wheat, barley, oats, rye, corn, rice, or other grain products, to various bean products, to cottonseed meal, to flaxseed, or other animal feeds must be suspected. Stock or specially prepared extracts of these are important for testing the patient. The mixed and prepared feeds f

nasobronchial, ocular, and cutaneous manifestations Cottonseed meal in fowl and cattle feeds is especially deleterious if it is inhaled by a sensitized person. Cottonseed allergy must be considered in workers in cotton fields, in those engaged in cottonseed oil mills and in others who contact this product in the industries. Allergy to the liquid and hydrogenated oils will be discussed under Ingestants.

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known to produce allergic manifestations. Two recent cases of atopic dermatitis lost their residual itching and eruption when eggs no longer were cooked in the house.

DRUGS AND MEDICAMENTS

Patients may be so allergic to various drugs that their inhalation in minute amounts gives rise to allergic manifestations. This portal of entry is not common for drugs as is the gastro-intestinal tract or the skin Through inhalation druggists may develop symptoms from ipecac. The inhalation of salvarsan has resulted in dermatitis.

FLY AND INSECT EMANATIONS

Allergy to the emanations of *lake flies,* as reported to the "May Fly" by Figley and to the "Caddis Fly" by Parlato, may produce serious nasal and bronchial symptoms The writer has observed similar cases at Clear Lake in California Likewise, in hot weather emanations of *butterflies, moths, gnats, and other flies* are so abundant in the air in certain areas that they may cause allergic symptoms. Hyposensitization with specific extracts gives good results. Other types of allergy to insect allergens, especially from bites and stings, will be described later.

SPORES OF FUNGI AND SMUTS

Allergy to the spores of fungi causes nasobronchial, cutaneous and probably other tissue reactions Spores are the germinal elements of fungi, and are about one-twentieth the size of pollens. Over 5000 species of fungi, including molds and yeasts, have been identified. They are distributed everywhere They may be found even to a depth of 4 feet below the surface of the earth and are abundant in the air, in small numbers, even at 7000 feet In the ground, fungi break down organic substances, especially cellulose and wood and, assimilating various nitrogenous and mineral compounds, they fix them in the soil Surrounding certain [illegible]
matter [illegible]
air cont [illegible]
high co [illegible]
the aid [illegible] penicillium are responsible for Camembert and Roquefort (see page 67) As is well known, yeasts are used in the manufacture of breads, beer, and wine

Much experience is required for the *accurate identification and classification of fungi.* An idea of the number of species of spores present in the air can be obtained by exposing sterile media in Petri dishes for brief periods to the air and then tightly covering them. The spores gradually grow at room temperatures and in a few days or longer, their visible and microscopic appearances allow classification Vegetations of all types are prone to have specific fungi. Moreover, the degree of moisture, the climate, the nature of the soil, and particularly the type of vegetation in

cows, cattle, and fowl, particularly the *chicken mashes*, have varying contents which must be known to the physician. The frequency of cottonseed and flaxseed in them should be kept in mind. Chicken raisers are subject to allergy from the dusts of feeds which may contain corn, wheat, barley, alfalfa, sardine meal, coconut, bone meal, yeast, cod-liver oil, molasses, and similar ingredients. Such air-borne allergens may blow for several miles and cause symptoms even in patients who live at some distance from the chicken farm.

FLOURS AND DUSTS FROM OTHER FOODS

Bakers, especially, and also cooks, grocers, and workers in flour mills may become sensitive to inhaled flours of varying types. Since *wheat flour* is most commonly handled in this country, it most frequently produces allergy. Flours from other cereal grains such as rye, oats, rice and corn, also may produce sensitizations in those who handle them. Furthermore, group allergens in the closely related grains also are a possible source of allergy. In sensitized patients large skin reactions are usually obtained by the scratch test, though, as in all types of allergy, skin tests may be negative. It is surprising that bakers who inhale large amounts of these cereal dusts for years, do not become sensitized more frequently. Their constant exposure may account for this. Even though they have short vacations, some flour dust remains in the bronchial tract for days or probably weeks. Thus the complete freedom from the effects of the allergen, which is so conducive to the development of allergy, does not occur

Control or reduction in allergic susceptibility to these cereal grains and their flours at times is possible with gradual specific hyposensitization, as discussed on page 38. When sensitized patients are being treated exposure to causative flours during the first few weeks is unwise. Thereafter *masks should be worn by bakers* especially while hyposensitization is continued. If the symptoms recur, further exposure should be prevented until treatment has been given for several more weeks. Some patients, unfortunately, cannot be hyposensitized. While injectant therapy continues, the elimination of the allergenic grains from the diet is advisable. One baker with bronchial asthma and large skin reactions to wheat and other cereal grains was relieved by a cereal-free diet so that he could inhale the flours without difficulty.

Handlers of other foods may become sensitized to the inhalation of allergens therefrom. Allergy to spices, especially pepper, to fish, vegetables, and fruits have occasionally arisen through inhalation of mere traces from the air. *Detection of the odors of foods* is accentuated greatly in certain patients. A nurse developed hay fever when she entered a home where grapefruits were on the table. Another patient rapidly had hives when she was at a table on which there was cauliflower or cabbage. The vapor and odor of certain vegetables and especially of fish and eggs have been

ingestant allergies, probably affects primarily the vascular tissues. Possibly the contraction of the capillaries in the fingernail bed which in many persons can be seen with a capillary microscope after the inhalation of tobacco smoke, is due to allergic reactivity. It is generaly agreed that the serious affection especially of the extremities, called thrombo-angiitis obliterans, is due to vascular allergy, usually to tobacco. Eczema and other dermatoses, especially those of the face, neck, and hands, may arise from tobacco allergy. Evidence may accumulate that allergy of the blood-vessels is responsible for some increase in high blood-pressure, for headache, dizziness, and other symptoms which are not definitely associated with tobacco allergy today. Various gastro-intestinal symptoms, including peptic ulcer, may arise or may be increased by this type of sensitization Good results with hyposensitization to tobacco allergens apparently are obtained in certain patients.

CHEMICAL INHALANTS

Allergy occasionally develops to air-borne *chlorine, phenol, lysol, ether, chloroform, formaldehyde, and other chemical substances.* Even a slight and brief smell of them may cause allergic symptoms. Acting as haptens, as explained on page 26, these chemicals unite with body proteins and cause specific sensitization. A nurse developed allergic dermatitis from air-borne chlorine twenty years ago and gradually became sensitized to many other chemical "odors" so that she could not work in hospital, office or home where she detected even a trace of the odors of any of these chemicals Attempted hyposensitization, first with infinitesimal amounts of a mixture of these various chemicals, failed to increase tolerance. *Naphthalene* which is used in moth balls and as an insecticide in gardens has produced asthma and dermatitis in two patients. Allergy from the ingestion, skin contact and therapeutic injection of various chemicals and drugs will be discussed later. *The fact that allergic reactions may arise from even the minutest amounts of these chemicals, and may result in hardly discernible symptoms or in more definite or serious manifestations, shows the great unrecognized possibilities of allergic reactivities to substances of all types*

INGESTANTS

FOOD ALLERGY

Foods probably produce more allergic manifestations in various tissues of the body than any other group of allergens This is due in part to the daily ingestion of foods, often in excessive amounts. Whether local or contact allergy, similar to the poison oak type of reaction, arises from foods in the mucous membrane of the gastro-intestinal tract must receive further study in the future. Most of the symptoms occur in the sensitized nasobronchial, ocular, cutaneous, ...

an area determine the kind of spores present in the air. As a result of spore counts by various students in America, the most common spores are known. Patients suspected of fungus allergy usually are tested routinely with 15 to 20 such allergens. *Smuts* which grow in grains may also produce allergy and routine testing with the important ones is desirable. Media may be exposed in areas around or inside the patient's home and autogenous fungus extracts can be prepared for testing and therapy. *Some of the most common fungi*, according to Fineburg, are alternaria, hormodendrum (cladosporium), helminthosporium, aspergillus, penicillium, mucor, rhizopus, saccharomyces (yeast), chætomium, monilia, trichoderma, fusarium, smut, and trichophyton.

Yeasts are fungi which maintain a unicellular growth and have no mycelia. Routine testing of all patients with yeasts is important. Patients not only inhale yeasts but ingest relatively large amounts in bread, in raised bakery products, including white crackers, graham crackers, and rye crisp and in beer. Yeast is discussed further on page 84.

Sensitization to spores of fungi may be the major but is more often the secondary cause of nasobronchial manifestations. This type of allergy, especially that to alternaria, often requires hyposensitization in patients with hay fever or asthma, primarily due to pollens in the eastern and especially in the mid-western States. Treatment, moreover, may be necessary when patients live in damp areas or homes where fungi grow more easily than in drier ones. Though antigens made with stock extracts usually are beneficial, autogenous specially grown cultures may be required if treatment is to be beneficial.

When dermatoses arise from allergy to fungus or yeast infections in distant skin areas or possibly in other tissues, hyposensitization with stock or autogenously grown and prepared antigens may be of help. When *such "id" eruptions* are suspected in the presence of epidermophytosis or a monilia infection, the use of a stock antigen containing trichophytin and oidiomycin may be desirable. The initial dilution should be so weak (often 1 to 100,000 or less) that exaggeration of the dermatosis is not possible.

TOBACCO ALLERGY

Many people become aware of their intolerance of tobacco. Probably most of these idiosyncratic reactions are allergic in nature. Sensitization to allergens in the tobacco or possibly in the paper or in other ingredients of cigarettes or in various essential oils, perfumes, and flavors added to pipe or chewing tobacco, causes reactivity in various tissues of the body. Therefore, the *main damage of tobacco may reside in allergy, rather than in the toxic effects of nicotine or of the various combustion products.* Many investigations, especially those by Harkavy and Sulzberger, have been made on skin reactions to tobacco allergens. Patients may react to one kind of tobacco and not to another. Skin reactions are obtained in a large number of individuals, including children who have been exposed to tobacco smoke. *Tobacco allergy, in common with other inhalant and*

duplicated in the other twin and similar symptoms often are present. Again, the tendency to develop allergy to pollens, animal emanations or foods may be familial. Allergy to individual foods such as milk, egg, fish, and onion may recur in two to four successive generations.

Food and other types of allergy may occur at any time of life. When the family history shows marked allergy, particularly to foods, sensitivity may appear soon after birth and gastro-intestinal symptoms and later eczema may present grave problems, as discussed on page 109. As age increases, hyposensitization or tolerance to the allergenic foods often increases and manifestations such as eczema, gastro-intestinal allergy, or bronchial asthma may disappear. However relief is not always persistent Usually the manifestations continue or the food allergy remains potentially active, ready to cause the same or other symptoms at a later age Food sensitizations may develop in late childhood, in adolescence, or in adult life. The writer has studied several patients who, in their fifties, sixties, or even later, for the first time had bronchial asthma or eczema from food sensitizations.

Allergy ...

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to ... foods in varying degrees of intensity.

In addition to the inherited propensity to develop allergy, especially to foods, *the eating of large amounts of a given food day after day or at separated intervals, tends toward sensitization thereto.* Eating of certain foods during digestive upsets or when fatigued or taking them with no other food, may result in food allergy. This effect has been attributed to deficiencies in vitamin intake, especially vitamin C But proof is lacking that vitamin deficiencies and glandular, neurotic, or chronic diseased states influence the onset of allergy When in infants a family history of allergy particularly to foods is found, new foods in the diet should be increased gradually and should be given every day or two for long periods. If these foods are discontinued for two or more weeks, infants may become sensitized, as are experimental animals two or more weeks after a single preparatory injection or the feeding of food ...

... mother's allergies are ... controlled through diet and other therapeutic measures and if during pregnancy the mother's allergies are properly treated. Furthermore, after birth the allergies must be controlled in the infant, and possibly milk should be replaced by other foods, during the first six to twelve months Even longer exclusion of eggs may be advisable.

Possible Prevention of Allergy.—When there is a definite inherited predisposition to allergy, *the eating of large amounts of food or the inhalation of large amounts of pollen or of other allergenic inhalants should be prevented.* This is especially true of foods which produce allergy more

intestinal, urological or other tissues, and are caused by the blood-borne food allergens which are absorbed through the gastro-intestinal mucosa. As formerly explained, all tissue cells of the body are more or less sensitized. The symptoms arise in the tissues or organs which develop the greatest degree of sensitization.

Symptoms From Causes Other Than Allergy.—*Gastro-intestinal symptoms, headaches, and less definite disturbances may arise from many causes other than allergy.* The fact that gastro-intestinal symptoms occur in appendicitis, gall-bladder disease, peptic ulcer, cancer, rectal disease, chronic diseases such as nephritis, diabetes, anemia, and many others, must be kept in mind. The patient often associates his symptoms with the imagined effect of some food. Without a careful examination and laboratory studies by the physician, the symptoms may be attributed incorrectly to food allergy. Foods eaten in excess or in a fatigued or nervous state may produce gastro-intestinal symptoms which must not be attributed to allergy. Unwarranted aversions for foods due to whims or fancies or to familial habits of eating explain certain dislikes or apparent food disagreements in some patients. *All these possibilities emphasize the necessity of a thorough diagnostic study of the patient for all possible causes of symptoms before food allergy is considered to be the only likely one.*

Frequency.—*Everyone is susceptible in varying degrees to food as well as to other types of allergy.* Analyses of the histories of large groups of people as those by Vaughan, have shown that 60 per cent had histories of past or present allergies, and that probable food sensitization was evident in 62 per cent, inhalant allergy in 23 per cent, and contact sensitization in 14 per cent. In these histories all evidence of allergy throughout life was not always elicited. Thus even a larger number of people undoubtedly is susceptible to food as well as to inhalant and contact allergens. Moreover, since most infections produce rashes and other symptoms due to allergy, it is obvious that few, if any, people die without having had various types and numbers of allergic reactivities. *This general tendency to allergy, however, is exaggerated and increased when allergy is definitely present or exaggerated in the family history as is discussed later*

Why Allergy Develops.—*An inherited predisposition to allergy best explains its origin.* If there is marked clinical allergy on both sides of the family, especially in the parents, allergic manifestations tend to develop earlier and are of greater intensity than if mild or unilateral familial allergy exists. Evidence of allergy is obtainable in almost all family histories if those of aunts, uncles, grandparents and cousins are analyzed. The degree and extent of clinical allergy, however, is usually intensified in the family history of allergic patients, especially if his own manifestations are severe.

Inheritance often determines the kind of manifestation and the type of allergy which develops in the patient. Thus asthma, nasal allergy, recurrent sick headaches, migraine, or gastro-intestinal allergy recurs in families. Often the allergic history of the patient is nearly identical to that of his mother, father or a sibling. Allergy in one identical twin usually is

Cyclic Recurrences.—*Symptoms which arise from food allergy and to a lesser extent from inhalant allergens, tend to recur in cyclic explosive attacks.* This is due to the so-called refractoriness or desensitization which develops after symptoms have existed for from a few hours to several days. During the attack, the reacting bodies which have increasingly bound themselves to the cells of those tissues in which the major allergic [illegible]

again accumulate in the shock tissues and with gradual or possibly sudden onset the symptoms may recur. Thus, the patient may eat the allergenic food, or less often, inhale the causative allergen continuously and only have allergic manifestations, such as bronchial asthma, nasal allergy, urticaria, recurrent headache or migraine, once every one or two weeks or months. *The patient may be potentially susceptible at other times.* Attacks may be precipitated by secondary causes such as wind, cold, excitement, infections, and in women by menstruation. These causes are further discussed on page 97. The termination of the attacks of bronchial asthma, especially in children, and of recurrent headaches may be brought about by the abstinence from all food due to vomiting, refusal to eat, or anorexia Gradually, as foods are again eaten, the attack recurs, according to the degree of sensitization. This cyclic recurrent tendency of allergic manifestations is so characteristic that a history of cyclic symptoms should always suggest allergy as a possible important cause. These recurrent symptoms, moreover, more frequently arise from food than from inhalant or infectant allergy.

The intermittent attacks may be due to foods eaten occasionally, or to air-borne allergens of any type occasionally inhaled. Which foods are responsible can best be determined by the patient himself or by the physician's analysis of the patient's eating habits or dietary history. Analysis of exposures to unusual inhalants will reveal possible inhalant causes. When the attacks recur with a definite or approximate periodicity every week or every eight weeks, for instance, refractoriness to food allergens which are constantly ingested or to allergens that are continuously inhaled is a frequent explanation of the relief.

Shock Organs.—*Patients may have allergic reactions in one organ or area of the body from one or more foods and in other areas from other foods.* Thus, one patient may have recurrent headaches from allergy to wheat and onions, as well as nasal allergy with nasal congestion from milk, right-sided abdominal pain and soreness from oranges, lettuce and bananas, and constipation and pruritus ani from wheat, apples and lemons Then again, one or usually a few foods may produce several different allergic manifestations

Association with Inhalant and Infectant Allergies.—*The concomitance of food allergy with inhalant and infectant allergies, must always be kept in mind* Some patients are affected by food allergy alone. However, the tendency to multiple types of sensitization is the rule. [illegible]

frequently than others, such as egg, milk, wheat, fish, nuts, cabbage and its related vegetables, coffee, orange, apple and banana and others, excluded from my elimination diets. This precaution is important especially when food allergy is evident in the family history. Furthermore, over-exposure to pollens, animal emanations and occupational dusts should be minimized when a personal or family history of inhalant allergy is found.

Overeating or excessive inhalation is prone to produce allergy in susceptible persons when it is followed by weeks or months of freedom from such foods, drugs or inhalants. Such a "preparatory" period between the sensitizing dose of the allergen and the subsequent so-called "shock" dose is necessary for the development of anaphylaxis in experimental animals.

These precautions may be advisable throughout life and particularly in childhood when the familial predisposition to allergy is definite. Fetal sensitizations may develop due to overeating or excessive inhalations by the mother during pregnancy.

Once allergy has evidenced itself, the proper diagnosis and control of the causative ingestants, inhalants, or infectants will minimize and reduce the allergic state in many cases.

Degree, Time of Onset, and Duration of Reaction.—*An allergenic food may produce symptoms in a few minutes, a few hours, or in one to three days after ingestion.* When a marked allergy is present, the symptoms may be immediate, and at times extremely severe, even associated with weakness, exhaustion, and collapse. When immediate symptoms occur, the reacting bodies are widely distributed through the body tissues and scratch reactions usually are easily obtained (as discussed on page 24). When less severe allergy is present, the onset of the symptoms usually is delayed one or more hours. *At times, the eating of the food two or more days in succession is necessary to break down temporary tolerance and produce symptoms.* In these patients skin tests may be negative or indefinite. The severity of the symptoms depends on the degree of the patient's allergy and on the amount of the food ingested. The mere trace or even the smell of a food may produce severe symptoms in very allergic patients These foods must be excluded from the diet and the meals must be cooked with great care, as discussed in Chapter V. When symptoms arise, they are due to food allergens brought by the blood to the sensitized cells, be they in the lungs, skin, brain or other tissues of the body. *It is probable that the allergens may remain in these cells for a long time, in some patients possibly for several weeks* Furthermore, an ingested food remains in decreasing amounts in the intestinal tract for one to two weeks. All the while, food allergens are being absorbed to a decreasing degree and probably are attracted and held by cells in the body tissues, especially in those in which the major sensitization is located. All these possible factors and conditions influence the degree and the duration of allergic symptoms.

of such possible influences, food allergy especially should be the object of study.

Food Dislikes and Disagreements.—*Food dislikes and disagreements* as reported by the patient must be noted since they *may be indicative of food allergy.* Many infants refuse to eat foods to which allergy exists. Such foods may cause vomiting, regurgitation, diarrhea, or other symptoms. Many adults have an inherent distaste for foods to which they are allergic and give a story of always avoiding milk, eggs, fish or other foods. However not *all these histories are indicative of food allergies.* As stressed by Alvarez, Vaughan and others, these dislikes and disagreements also are due to fads or fancies established through habits of eating or other psychic influences Gastro-intestinal or other constitutional disease may also be responsible, though the possibility of gastro-intestinal allergy must be remembered Many patients, moreover, like foods and have experienced no self-recognized disturbances from foods which are found by the physician to be productive of definite allergy. Thus, the history of food dislikes or disagreements is valuable from the diagnostic viewpoint, provided it is [illegible] cian. [illegible] In brief, t[illegible] rasies, the interpretation of skin reactions to food allergens which are obtained and the important use of trial diet, yield information of varying importance in the final determinination of the rôle of food allergy in the patient's problem The elimination diets for trial diagnostic study of such patients are described in Chapter V.

HYPOSENSITIZATION

Food allergies tend to diminish in childhood, especially if the causative foods are eliminated from the diets When mild allergies are present at any time of life, such elimination for a few weeks or months may suffice to restore tolerance for weeks, months, or even for years. In many patients, however, continued and complete elimination of allergenic foods is necessary for one or several years In others hyposensitization below the symptom threshold never occurs, or only partial tolerance is regained. Tolerance for foods may last for weeks, months, or years, according to the ability of the tissues to hold the hyposensitization which has been established.

When allergies to important foods such as wheat, milk, or eggs, or to large numbers of important foods such as vegetables or fruits occur, *hypodermic administration of antigens* containing these foods (see page 142) has been attempted by many physicians [illegible] day or so, and raised gradually according to the patient's response, may prove more beneficial. *Oral hyposensitization also has been successful in certain hands.* However, the decision that hyposensitization has resulted must be reserved for

most patients should be tested with all important food and inhalant allergens and their histories should be carefully analyzed from the viewpoint of all types of allergy. Successful treatment usually necessitates the control of all existing allergies. A few patients with minor food sensitizations are relieved by the proper treatment of their inhalant allergies. Occasionally patients with hay fever due to pollens are relieved by the elimination of allergenic foods

Seasonal and Geographic Influences.—*Food allergy often is definitely influenced by seasons and geographic locations.* Similar effects on inhalant sensitizations have been discussed on page 37. For many years, the writer has observed *the beneficial action that the summer months exert on many food allergies.* This benefit increases from mid-April until the longest day and gradually decreases until the middle of August or September—approximately from one equinox to the other. This increased tolerance allows many patients to eat the foods from late spring to early or late fall without allergic symptoms. Steadily, from August until December or January, tolerance for allergenic foods decreases; thereafter it increases again until June. The seasons do not affect all food allergies, especially not when they are marked. The favorable effect of the summer months probably resides in the increased amount of electrical and radiant energy available. Humidity, atmospheric pressure or ionization of air has failed to explain the benefit.

Furthermore, food allergy is diminished or inactivated in certain patients by residence in a dry and especially in an inland area. In the San Francisco Bay area, the writer has had an unusual opportunity to arrive at this conclusion. Foods which cause asthma, nasal blocking or eczema here, produce no symptoms 15 to 20 miles inland in or beyond the coast range mountains, even on the river delta of the Sacramento and San Joaquin, or in Contra Costa, Sonoma, Napa, or Lake Counties. However, when these patients eat no allergenic foods they can remain on the shores of the ocean or near the bay without difficulty. The reason for this effect is unknown. Altitude certainly is not responsible since low areas such as Death Valley are beneficial So-called marine asthma has been described in Europe. The frequency of asthma along the ocean, especially in large cosmopolitan areas, has long been known. On the contrary, the benefit of desert climates and of residence in the dry inland plateau and the southwest of our country has attracted thousands of patients with nasal, bronchial and other chronic symptoms, many undoubtedly due in whole or in part to food sensitizations.

The freedom from environmental allergens caused by geographic changes explains the relief of symptoms in many inhalant-sensitive patients. The possibility of inhalant allergy has been excluded in all patients in whom these geographic and seasonal influences on food allergy have been reported.

These effects on food allergy were discussed by the writer in 1941 in the Journal of Allergy. Their possible occurrence in other maritime and inland areas in this and other countries needs investigation. In a history

When symptoms occur from food allergy, as well as from other types of allergy, epinephrine is indicated. It is given hypodermically in doses of 0 1 to 0.8 cc. of a 1 to 1000 dilution every five to thirty minutes according to severity of the symptoms and repeated every hour if necessary. It is valuable, especially in bronchial asthma, urticaria, angioneurotic edema or atopic dermatitis, and may be used when acute gastro-intestinal allergy or allergic migraine are suspected.

Epinephrine, 1 to 100, may be vaporized by a special glass atomizer and inhaled for relief of mild bronchial asthma, for mild pruritus and possibly for other mild allergic manifestations (see page 102) Droplets of this strong epinephrine must not enter the mouth and be swallowed since they may cause severe gastric pain and distress. Thus, the mouth should be rinsed with water after these inhalations.

Attempts to change or reduce food sensitizations by peptone therapy given by mouth or hypodermically have failed in almost all cases. The hastening or enhancement of gastric or intestinal digestion by the use of d[illegible]
no c [illegible]
and [illegible]
of f[illegible] allergy.

Recently histamine, given hypodermically or in small doses slowly by vein, has benefited patients with some manifestations of food allergy (see page 116). Histaminase, a ferment which breaks down histamine, given by mouth or hypodermically, has failed to decrease food allergy except in a rare case (see page 116).

FOODS AND CONDIMENTS*

Origin, Habitat, and Biological Relationship.—*Though allergy can develop to any food, it is most common to those foods which are eaten in large amounts nearly every day or intermittently with two [illegible]*
vening [illegible]
common [illegible]
peanuts, [illegible]
food [illegible]

[illegible] *sensitization to one of them.* [illegible] allergy to one food without reactivity to closely related foods possibly occurs more frequently than group reactions This tendency to the development of group allergies also exists in inhalant and probably in infectant allergy. For example, in pollen allergy, sensitization to nearly all gramineæ pollens of varying genuses and species is common. The classification of vegetable and animal foods, according to family, genus and species will be found on page 214. Some experimental study of these

* For much of this information the writer is indebted to Vaughan, W. T., The Practice of Allergy, St. Louis, C. V. Mosby Company, 1939

those foods whose ingestion reproduces clinical symptoms, since a positive skin reaction may occur in the absence of clinical allergy. Therefore in practically all cases, prolonged and accurate elimination of the causative foods must be depended upon for possible hyposensitization and increased tolerance.

DENATURIZATION OF FOODS

Heat and drying in varying degrees so modifies the allergens of foods that some sensitized patients can ingest these denaturized foods without resultant symptoms. For instance, in many people hives or gastro-intestinal symptoms develop from uncooked but not from cooked fruits. Tuft recently reported positive skin tests with allergens of fresh fruit and not with those of cooked fruit. Ratner reported that certain infants can take boiled or canned milk, but not uncooked or pasteurized milk. Moreover, modifications of allergens seems to occur from the action of acids as in the lactic acid products of milk. Tolerance for denaturized allergens, however, usually occurs in the mildly sensitive patient. *In the writer's practice, infants, children, and adults who are definitely sensitive to milk, wheat, or fruits usually necessitate total elimination of all these foods, even though they have been superheated for a long time.* Thus, the elimination diets as detailed in this volume do not include any denatured foods When symptoms have been relieved, canned milk, cooked fruits or other denatured foods may be used. If symptoms recur, a high degree of allergy to those foods is indicated.

The fact that allergenic activity always cannot be destroyed by superheating is demonstrated by the persistence of the skin reacting bodies to many autoclaved allergens which in the unheated state give large reactions in allergic patients.

BIOLOGICAL RELATIONSHIP OF FOODS

Vaughan and later Ellis published a list of important foods according to biological relationships. These may be found on page 214. *When a patient is clinically sensitive to one food with or without a skin reaction, he may also be allergic to closely related foods* Thus some patients have a group sensitization to all cereal grains, to all legumes or to all citrus fruits. However, *this is not always true* since wheat, orange, or apricot allergy frequently occurs without sensitization to its biologically related foods. As stated on page 13, when skin reactions occur, clinical allergy is not necessarily present and can only be determined by the reproduction of symptoms after the feeding of suspected foods The degree and time of onset of the reactions must be kept in mind, as discussed on page 54.

TREATMENT OF FOOD ALLERGY

Increase in tolerance to the eliminated foods, by the natural tendency —especially in children—to become less sensitive, and, occasionally, by hypodermic or oral desensitization, has been discussed.

dark pumpernickel bread may contain wheat. Therefore great care must be exercised in the purchase of bread for allergic patients. Ry-Krisp produced in America is made of pure rye. Most Scandinavian knackebrod or hardtack is made of pure rye flour, but at times it is dusted with wheat flour. Rye is commonly used for making whiskey.

Oats (avena sativa) was first mentioned in Roman writing as being used by the Germans. Since it lacks gliadin, it cannot be leavened into bread. It is used in gruels, cakes, mush, certain crackers, cookies, and muffins

Barley (hordeum distichon) probably was the first cereal to be used by man. Its use was recorded by the Egyptians. At the present time it is used principally for making of malt. It is allowed to sprout or germinate so that diastatic enzymes are formed. These convert starch into sugar in the manufacture of beer and ale and the sugar is then converted into alcohol by yeast. Thus, *beer, ale, stout, and porter* are made with malt of barley, and at times, of wheat, rice or corn. Some *whiskeys and gins* are made with barley. Pearl barley is used as a breakfast food and in soups and broths. The breakfast foods containing barley are listed on page 223.

Rice (oryza sativa) was used in China 3000 years B.C. and is the important food of one-third of the world's populace today. It is raised extensively in flooded warm areas in Asia, and in California, Texas, the Carolinas and similar regions in the United States Unpolished rice usually is used in the Orient. Polishing, as practiced in this country, removes the husk and with it most of vitamins A and B. Rice flour makes poor bread because of its lack of gliadin. Vermicelli or macaroni can be made of pure rice flour. "Sake" is a beer made from rice in Japan. Various products containing rice are listed on page 223. Because of the large content of the B vitamins in rice polishings, they are used as such or in concentrates of various vitamin preparations.

[illegible] is eaten extensively here in America

Corn (zea mays) has been grown in the Americas [illegible] thousand years [illegible] first arrived. [illegible] bread It is used in varying proportions and with different ingredients in corn pone, spoon bread, ash cake, batter bread, griddle and pan cakes. [illegible] ground between stones, keeps poorly because the corn germ contains fat. Processed corn meal, freed from the germ, dried in a kiln and rolled at a high temperature between rollers, spoils less readily and can be mixed with other flours for baking White and yellow corn meals are made A special species of

specific and group allergens has been made. Their existence, however, has been indicated almost entirely by clinical evidence. Further experimental investigation of these specific and group allergens in closely related foods is important. The effect of heat and drying on food allergens, as discussed on page 58, must be kept in mind when foods and menus are ordered and prepared for the food-sensitive individual.

CEREALS

The carbohydrate foods which are obtained from the seeds of grasses are called cereal grains. They include wheat, rice, corn, barley, oats, and rye. As noted before, patients may be sensitive to one or more of these with or without sensitizations to the related ones. The most commonly eaten grain produces most allergy. Thus, wheat is certainly the chief offender in America, whereas in Japan rice, and in the Scandinavian countries rye may be the chief cause of allergy.

Wheat (triticum sativum) has been a favored food for several thousand years. It is pleasant to the taste and is more easily leavened than any other cereal flour, because of its gliadin content. Over 300 varieties of wheat varying in softness and hardness have been developed. Two kinds of flour, namely graham or whole wheat and patent or white flour, are in use. A physician, Sylvester Graham, in about 1850, recommended the whole wheat flour to which his name was given.

Wheat is used in the making of almost all commercial breads, bakery products, pies, cookies, cakes, many dried and commercial breakfast foods, macaroni, spaghetti, vermicelli, noodles, gravies, sauces, thickened soups and creamed foods. Commercial rye and buckwheat flours and probably many soy, lima bean, rice, corn and potato flours contain wheat. Unleavened bread or the Matzoth of the Jewish Passover is a wheat wafer with no yeast. Various commercial foods which contain wheat are listed on pages 220 to 226.

In order to be certain that all wheat, egg, milk, or other forbidden foods are excluded from their diets, patients must know every ingredient of all prepared foods and also the composition of the flours and of other products used.

The frequency of allergy to *yeast*—at times to one species of yeast—is discussed on page 50. This allergy may require the elimination of yeast-raised bakery products and the use of baking powder instead. Other yeasts and fungi in bread and bakery products as in all other foods, evidenced by the growth of such fungi therein with suitable moisture and warmth, may produce allergy in occasional individuals.

Rye (secale cereale) has been used for food probably as long as wheat. It grows in colder climates than wheat, especially in northern Russia, Scandinavia, Germany, the Dakotas, Minnesota, and Wisconsin. It contains less gliadin and thus leavens less easily. Commercial rye flours usually contain wheat to diminish the heaviness and strong flavor of pure rye bread. Rye bread nearly always contains wheat. Even the

manifestations, but less frequently than cereal grains. Sometimes both potato and tomato allergy occurs in the same patient. Often apparent allergy to potato is due to foods such as butter, milk, wheat, cottonseed oil, pepper, etc., with which the potato is cooked. Potato starch, combined with rice, rye or other ingredients, makes satisfactory cakes, muffins, and cookies. It may be used as a thickening or in place of cornstarch and is contained in various bakery and culinary recipes. Potato chips are cooked in various vegetable oils, especially cottonseed oil, to which allergy may exist. Potato syrup and sugar also are used in Europe.

Sweet potato (ipomœa batatas) is a member of the morning glory family and is a fleshy root. It is eaten as are white potatoes. Candied, baked sweet potato is popular. Glucose and alcohol are products derived from it. Its flour is used in the Orient. Yam is a watery sweet potato grown in the Southern States and is different from the Oriental yam which is a member of the lily family.

Tapioca (manihot utilissima) is a starch from the roots of the cassava or manioc tree. Many varieties are grown in Equatorial South America, Central America, Africa, India, and the East Indies, where it is a common food. In Brazil, the manioc root is a staple food. Some varieties are eaten as potatoes, and manioc meal lasts well and is commonly cooked as a substitute for bread. In America tapioca is sold in pearled, granulated, or flaked form, or as a flour. It is of special value in cereal-free elimination diets. The cassava starch is used in yeast cakes and as a laundry starch. The United States imports about 300 million pounds each year but none during this war period.

[illegible]

Taro, kalo (colocasia antiquorum esculenta) is grown in many varieties in the Hawaiian Islands, Tahiti, Japan and the East and West Indies as an important source of starch. Poi is fermented paste pounded from [illegible]

[illegible] America

Buckwheat (fagopyrum esculentum) is related to rhubarb. The flour is derived from the large seeds. A native of Europe and Asia, it was raised by Chinese a thousand years ago. It grows on poor soil in many areas, even in high altitudes. Since the seed resembles the beechnut,

Indian corn with much endosperm in hard kernels is used for popcorn. Corn oil is obtained by pressing the germ. It is used for salad oil, Mazola oil being of this kind, and also in soaps, paints and salad dressings. Cornstarch is used in puddings, sauces, gravies, and soups and especially in the laundry. A vegetable gum, dextrin, and British gum is used on postage stamps, envelopes and in the finishing of many textiles. Corn syrup or commercial glucose is made from cornstarch. Karo is the usual product sold, though corn glucose is used in many candies, jellies, preserves, maple syrups, and other sweetened products. Corn also is used to make whiskey and beer. A list of products containing corn is found on page 223.

SORGHUM (sorghum vulgare) is not closely allied to corn. This grain grows on a grass similar to Johnson or barnyard grass. One species is used to make sorghum molasses and another is ground and used in pan cakes and puddings It is mixed with other flours and used to make bread in the Southern States.

Cane sugar (saccharum officinarum), a member of the grass family, was first grown in Bengal. It was eaten in Indo-China, in the Malay States, in Africa, and in Europe as early as the 8th century. It was brought to America by Columbus. Today it is grown in all warm moist areas of the world. In the United States each person uses a yearly average of 94 pounds of sugar. The question of allergy to cane sugar is uncertain. The amount of allergen from the original cane itself is so infinitesimal that sensitization to it or to any other possible ingredient in purified cane sugar is hardly conceivable. Although many people attribute symptoms to sugar, other ingredients in desserts, cake, or candy, such as chocolate, milk, wheat, nuts, or fruit usually are responsible. As Vaughan stated sugar may act as a hapten and cause allergy as described on page 26. Allergy to the unpurified molasses may occur, though no records are published. Most commercial molasses contains corn glucose. There is some evidence that patients may be allergic to cane sugar and not to beet sugar or to corn glucose. Those who are sensitive to beet sugar pollen or to beets may be sensitive to beet sugar if allergens exist in it.

MILLET is a cereal grain used as food in Asia In this country it is used in animal feeds.

BAMBOO (bambusa) is grass, the young shoots of which are used for food in the Orient and by the Chinese here in America. The grains or seeds of the bamboo are not used as food.

OTHER CARBOHYDRATE-RICH FOODS

White potato (solanum tuberosum) is closely related to the tomato, red and green pepper, and eggplant (see page 77). A native of Chile and Peru, it was brought to Europe by Raleigh and then to the American colonies. The potato forms on an underground stem as a growth or tuber. The sweet potato is different botanically; it is a fleshy root. The white potato apparently is a growth due to irritation of specific ground fungi on the terminal bud of the stem. This food produces various allergic

milk can be replaced by equal amounts of protein in meat, fowl, fish, legumes, and eggs The vitamins in milk can readily be supplied by those in other foods or by vitamin preparations. The majority of the world's population drinks little or no milk of any type after weaning. Moreover, the importance of calcium in the prevention of tooth decay is doubtful, in spite of advertisements and the contentions of certain dentists Thus, though milk is an excellent food for persons of all ages, particularly for infants and children, it is not essential and can be eliminated entirely without nutritional damage, provided the proper amounts of protein, fats, calories, vitamins, and minerals, especially calcium, are contained in the diet recommended by a physician or a dietitian who is familiar with the carbohydrate, protein, fat, mineral, and vitamin content of foods As examples of milk-free diets, all the menus for the elimination diets and the diets recommended for milk-sensitive infants and young children in this book are available. A diet from which milk alone is excluded is discussed on page 197.

Since the milk, serum, meat, skin, and hair of an animal such as the cow contain a small amount of identical allergens and other dissimilar and specific ones, certain patients may become sensitive to the milk, meat, and emanations who originally were sensitized to only one of these. ✓ Thus, *some patients who are sensitive to cow's milk also are allergic to beef, and to cattle dander* The sensitization to horse meat, dander, and serum is noted on pages 70 and 94

Cow-milk allergy [illegible]
vic [illegible]
occ [illegible]
cli[illegible] sensitive patients, however, fail to give skin reactions. Milk allergy tends to run through several generations of certain families, as noted on page 21 Overfeeding and forcing of milk probably sensitizes many infants, children and even adults *Aversion for milk and anorexia* or [illegible] A
gr[illegible]
wi[illegible]
frequent [illegible]
to eat wit[illegible] promises and stories may have good appetites and eat with relish at and between meals when allergenic foods are excluded.

Allergy may develop to allergens which pass from the blood into the milk. Thus, allergens of various foods eaten by the mother may occur in her milk Their amounts, it is true, are nearly infinitesimal but they are sufficient to cause symptoms in the very sensitive infant. In the same way, allergens from grasses, weeds, flaxseed, cottonseed meal, peanuts, grains and the like may occur in cow's milk. Thus, milk from a cow may cause symptoms in the allergic individual at one season and not at another The presence of various pollens in honey is suggested by this as noted on page 88

The degree of allergy to milk varies Very sensitive patients cannot even take a small quantity of butter which contains a minute amount of

its name is derived from the German buchweizen, or beech wheat. The pure flour may be used for cakes and bread. Commercial flour is usually mixed with other flours. Jews make a pure buckwheat soup called Kasha.

Flaxseed (linaceæ) grows on flax, the fiber of which has been used to make cloth since Egyptian time. The seeds were eaten by Greeks and Romans. It still is used in Roman Meal and in Uncle Sam's Breakfast Food, and especially in stock feeds and in chicken mashes and feeds. Flaxseed tea and poultices have been used medicinally for many years. It is used as a hair set, though karaya gum is preferred. Allergy to it may be severe, and is often associated with a large scratch reaction. *Linseed oil* is made from flaxseed and is used in paints, varnishes, furniture and floor oils and polishes, and in printer's and lithographer's inks. Linoleum, oilcloth, oilskin coats, and other articles are made with it. It may also be in depilatories and hair tonics.

Flours made from soy and lima beans, from banana, cottonseed, sweet potatoes, peanuts, and chestnuts will be discussed together with fruits, vegetables and nuts.

DAIRY PRODUCTS

Milk.—Milks from different animals, including the *cow, goat, mare, sheep, ass, and camel,* are used in various parts of the world. *Human milk* from wet nurses or in cans is used for infants. In America and Europe, cow's milk and, secondly, goat's milk are used most frequently. Clinical and experimental evidence indicates that the lactalbumins in the wheys of different milks contain dissimilar protein allergens and that the caseins of milks probably are identical. Lactalbumin allergy is more frequent than casein allergy which probably is the reason why patients sensitive to cow's milk may tolerate goat's milk. Recent work, however, indicates that allergens common to the lactalbumins of several milks may exist, and may produce allergy from all these milks The effect of pasteurization, boiling, super-heating, and drying of milk on its allergenic activity has been discussed on page 58. Mare's, sheep's, and camel's milks are used as such or in cheeses in southern Europe, Asia, Africa, and in other countries where cows and goats are not common

✓ *Though milk is an important food, especially for infants, it is not essential at any age for proper nutrition.* Here in America, the dairy- and milk-dispensing interests have so stressed the value of milk that the opinion unfortunately is widely held that 1 quart or more of milk a day is necessary for young children and adolescents and that 1 pint or more is important for adults. Stress on such quantities because of the calcium content is unnecessary. If milk is entirely omitted, calcium carbonate, gluconate or other salt given daily (see page 141), together with a proper amount of other foods, will meet the accepted daily requirement of 1 gram of available calcium. Many adults give a history of taking no milk or additional calcium for many years with no evident depletion in calcium in their bones Indeed, many milk-sensitive people have excellent physiques and perfect teeth, often with no decay. The protein content of

Cheese.—Cheese contains milk proteins, usually casein with minute amounts of lactalbumin. When patients are allergic only to lactalbumin they may be able to take cheeses made almost entirely of casein. However, those who are exceedingly sensitive to lactalbumin may react to the trace of this allergen which is present in all cheeses. They would react especially to those cheeses which contain larger amounts of whey or lactalbumin such as cottage, cream, or buttermilk cheese, as well as Neufchatel, Gervais, Scandinavian or Danish mysost cheeses. Vaughan has listed the following cheeses made of cow's milk:

American Cheese
Appetitost
Bondost
Brick
Brie
Buttermilk
Caciocavallo
California Jack
Camembert
Cheddar
Cheshire
Cottage
Cream
D'Isigny
Dunlop
Edam
Emmenthaler
English Dairy
Floedoest
Gammelost
Gervais
Gorgonzola
Gouda
Goya
Gruyere
Hand
Koesher Gouda
Leyden
Liederkranz
Limburger
Lodigiano
Munster
Mysost
Neufchatel
Oka
Parmesan
Pineapple
Pont L'Eveque
Port du Salut
Pennsylvania Pot
Provolone
Rabbit
Rat
Sage
Sap Sago
Sbrinz
Smearcase (Schmierkase)
Sorrento
Stilton
Store
Schweizer
Swiss

Vaughan, The Practice of Allergy, St. Louis, C. V. Mosby Company, p 419, 1939.

[illegible]

are sold. Other animal milks are used to make various cheeses. Koumiss is fermented asses' or mares' milk.

Each area in the world [illegible] with varying ingredients [illegible] after, fungi of varying ty[illegible] become allergic to these [illegible] and Camembert cheese [illegible] nearly replaced Other cheeses are flavored with spices such as sage, cloves, caraway, various herbs and pimento to which allergy may develop.

Egg.—Egg allergy is very common and is responsible for many and often severe allergic manifestations Allergy to the albumen in the egg white is much more common than to the protein in the yolk. This allergy may be present at birth. It apparently arises from sensitization in the uterus by egg eaten by the mother or through an inherited propensity to egg allergy. It may be extremely severe at any time of life, especially in infancy and childhood and it often is associated with a large scratch skin test. After all egg products have been eliminated from the diet for several years, the skin reactions may disappear and tolerance for egg may develop. When egg allergy is active, sensitization to the albumen

milk. Moderately sensitive patients may take moderate amounts of butter or cream but no definite amounts of milk. They also may take denaturized, heated, canned, or dried milk in varying amounts. Patients who are sensitive only to lactalbumin may eat various cheeses. Mild milk allergy may produce slight subclinical symptoms which make the patient feel under par or slightly ill without obvious symptoms. Various foods which contain milk are listed on pages 221 to 225. The milk-free diet, including substitutes for cow's milk is discussed on page 197.

Goat's milk, as already stated, produces allergy in many patients who are sensitive to cow's milk. This sensitivity is found especially when allergy exists to casein which apparently is identical in all milks. All that has been written concerning cow's milk applies to goat's milk. If goat's milk is used, it must be adequately pasteurized to prevent transmission of infections, including diphtheria, streptococcal infections, undulant fever and tuberculosis. Its prolonged use tends to produce anemia in infants and young children. Canned goat's milk is sold by the Goat Milk Products Company of Los Angeles

Cream and Butter.—That cream and butter contain milk proteins and other allergens is important to realize. Fifty to 80 per cent of the cream on the market consists of milk. Butter contains a minimum of 0.6 per cent of milk curd or casein and up to 1 2 per cent depending upon the thoroughness with which the butter granules are washed with pure water after the buttermilk is drained off A trace of lactalbumin and other milk proteins is also present. This small amount of milk allergens is sufficient to produce severe symptoms in patients who are very allergic to milk, especially in those who also are sensitive to casein. This sensitivity is illustrated in the case of a young girl who had severe attacks of asthma with fever up to 104° F., delirium for six to fourteen hours, and vomiting for several hours. Her condition was due primarily to milk allergy. After milk in every form had been eliminated from her diet for one year, a teaspoonful of butter caused the recurrence of her symptoms with dramatic severity within three hours. Various butter substitutes are listed on page 157. Butter is colored generally with 2 ounces of a yellow fluid made from annatto seeds to every 1000 pounds, or with other coloring matter. No study has been made concerning the possible allergy to this seed.

Oleomargarines contain various vegetable and animal fats as well as milk protein. Most of these are churned in milk or cream and contain up to 2 per cent milk casein. Annatto or other coloring matter and salt are added. Allergy may exist to the allergens in any of the fats as well as to the milk allergens Their use, therefore, is contraindicated in milk-sensitive patients and in those who are sensitive to the allergen in the specific fat used to make the oleomargarine. Some butter substitutes contain no milk products. Nuspread is made with a hydrogenated cottonseed oil, colored light yellow and flavored with butyric acid. A [illegible] artificial

such as beef or pork. One child with generalized atopic dermatitis was allergic to allergens in all animal foods, including all meats, milks, fowl [illegible] Allergy to canned human milk was not determined. Fortunately [illegible] and adequately [illegible] meat, liver, [illegible] only to one [illegible] mammalian [illegible] possibility [illegible] beet tops, that animal feeds such as corn, peanuts, [illegible] influence the allergic reactivity of the meats, needs experimental study. The final determination of the patient's reactivity to meats and tissues, as in all food allergies, must depend on diet trial, in which the food in question is given to the symptom-free patient for a number of days. Even with such diet trial, potential or very mild allergy may not be demonstrable Obviously, reactions to various meats may be due to the condiments, gravies, or fats cooked or served with the meats.

When the sensitization to all mammalian meats exists, possible tolerance of the meat of frogs, fowl and fish should be studied. Allergy to all animal proteins, including fish and fowl rarely occurs. Such a case is discussed in the foregoing paragraph. The importance of soy bean as a source of necessary amino acids in these patients is discussed on page 76.

Beef produces various allergic manifestations in a few patients. Vaughan estimates that about 4 per cent of the beef allergies are associated with cow's milk allergy though the sensitization may be to one or the other food alone. One patient was allergic to beef, lamb, and pork and could take milk with no difficulty. Veal which comes from the baby steer or cow theoretically should be similar to beef. However, an occasional patient, as reported by Kern, has a specific allergy to veal alone.

Lamb causes less allergy than beef and pork. Thus it may be used as the sole source of animal protein in diet trial when allergy to other animal proteins is suspected Such use of lamb occurs in my Elimination Diet I (see page 161), and may be advisable in my supplemental elimination diets (see page 147).

Pork causes more allergy than either beef or lamb. The manifestations at times are severe A physician who had a rash from pork all her life could not take lard or even a 1-grain thyroid pill of pork origin without causing the rash to recur At times allergics can eat ham and especially bacon, probably because of the denaturization of the pork protein by smoking and processing Bacon, usually contains a comparatively small amount of meat and is denaturized by the high temperature of frying. The larger amount of meat in Canadian bacon must be remembered. Various allergens which accumulate in ham or bacon during their processing and curing may produce allergic reactivity in the rare individual. Foods and condiments used in the cooking of hams and in gravies are discussed later.

and the yolk usually is present. Furthermore, it is impossible to separate yolks from the whites so that every trace of albumen is removed. Therefore, the elimination of the white, as well as the yolk of the egg is important in egg-sensitive patients. When relief is assured, the degree of tolerance or of allergy to albumen and yolk can be determined by trial ingestion.

Egg *is used in the manufacture of most ice creams and of many sherbets, mousses,* and water ices. The commercial ice cream and dessert powders may contain powdered egg and milk. Egg also is used in most cakes and cookies, many breads, especially whole wheat bread, in French toast, pastries, muffins, frostings, icings, meringues, custards, puddings, waffles, hot and griddle cakes, cream sauces, *desserts, prune and other whips, salad dressings and mayonnaise.* Macaroni, spag [illegible] beef [illegible] is use [illegible] confe [illegible] *is rubbed over buns, bread, and pretzels to produce a glaze. Breads may be sprayed* with egg or milk to produce a sheen and crust. Some baking powders (not Royal, [illegible] Ovaltine, Ovomalt, [illegible], coffee, and [illegible] ken, fritters, [illegible] *es, often in* small amounts. Certain pharmaceutical emulsions and other medical preparations, such as nose drops, contain egg. Therefore, the egg-sensitive patient must keep all these possibilities in mind and must never take any food, the entire content of which is not known.

Egg *yolk is used by furriers in dressing some skins, and in tanning and preparing* some glove leather. The use of egg albumen in photography as a film emulsion and in printing cotton and textile fabrics may be responsible for contact eczema in very sensitive patients.

Since albumens of the eggs of most birds are antigenically similar, the eggs of ducks, turkeys and other fowl rarely can be tolerated by hen-egg allergic patients Probably there are group allergens and species-specific allergens for various eggs, as for other allergens. (See page 59.) Further experimental study of the relationship of the various allergens in eggs of different birds and of their relationship to the allergens in flesh, blood, and other tissues of such birds and of other animals is important Some patients who are sensitive to egg are also sensitive to the feather and meat allergens, but this is not the rule.

MEATS

Allergy to the meat and organ tissues of mammalians occurs although less frequently than to milk, egg, cereal grains, fish, and certain other foods. Through immunological animal experimentation, it has been shown that similar allergens exist in the tissues of closely related animals As with other groups of foods, such as cereal grains, milks, and eggs from biologically related animals, certain allergens in the closely related meats probably are identical and others may be specific for each animal. Thus [illegible]

group allergens. Allergy to the meat and egg of chicken is not uncommon and may be associated with or without definite scratch reactions.

As with meats, the allergic patient who is on an elimination or other trial diet must not eat fowl which has been rubbed with butter, oil, or garnished or basted with any spices, condiments, or any food preparation which has not been ordered and allowed by the physician. This care also is imperative in regard to stuffing or other foods cooked in or with the fowl. It is probable that some patients are so sensitive to wheat, corn, or spices that symptoms develop when they eat the meat of fowl stuffed with these allergenic foods. *Allergens from foods in stuffing or dressing may permeate the meat during the cooking or adhere to it because of proximity thereto.* Knowledge of all ingredients in the gravies served with fowl also is essential. Drippings from the roasting fowl, of course, contain food allergens as of butter, flour, oil, or garnishings rubbed on the bird or cooked with it. If these foods are not allowed the gravies should not be used Neither should spices nor pepper be incorporated unless specifically ordered by the physician.

True Fishes (Vertebrates).—All the edible fishes except eels have fins. As is seen from the [illegible]
to many [illegible]
from ski[illegible]
that sen[illegible] usually exists to several or many fishes in different families but not necessarily to the fishes of all genuses and families. Indeed, specific allergy to one fish with apparent tolerance to all others may occur. These crossed sensitizations infrequently are associated with allergy to various shell fishes, though they [illegible]
The same species of fish m[illegible]
for instance, the sardine. T[illegible]
of one or two of the repres[illegible]
Testing with the allergens [illegible] fishes which are commonly eaten should be done if the history so indicates. As with all food allergies, skin tests may be negative when clinical allergy is present However negative skin reactions occur less frequently than is the case in milk, vegetable, or fruit allergies; in fact, some of the largest ones occur to fish allergens.

These large scratch skin reactions *often* are associated with marked degrees of clinical allergy. The symptoms, be they asthma or cutaneous or gastro-intestinal manifestations, often occur soon after even [illegible] minute trace of the [illegible]
fish cook[illegible] *s from*
which a[illegible] *ller in*
refrigera[illegible] *same*
marked [illegible] The
[illegible] again indicate the importance of testing patients with the scratch method and only with the intradermal method when negative scratch tests are obtained. (See page 24.)

The problem of group allergens and species-specific allergens again arises, as discussed concerning other foods on page 59. Laboratory

Horse Meat is used in Europe and to a varying extent in this and other countries especially during this war. Its use in dog food here in America makes possible its accidental human consumption. As discussed on page 94, a group sensitization to common allergens in horse meat, horse dander, and horse serum may exist. Sensitization to one may predispose to allergy to other allergens in these related proteins. *Mare's milk* is used in some countries, such as Russia, and children fed with it may become allergic to horse serum. Goat meat when eaten may cause allergy.

The Meat of Rabbit, Squirrel, and Other Rodentia may cause allergy in predisposed patients. Reindeer and other deer meat must be remembered as a more or less common food. Other mammalia, such as bears, buffalo, and various rodents which are eaten in different areas of the world may cause allergy. Meats of mammalian animals which do not belong to the Bovidæ, as shown on page 217, may be of value to the occasional patient who cannot take beef, lamb, or pork.

Liver allergy, which produces various manifestations, may exist along with or independent of allergy to the meat of the same animal or of other animals. Thus, a patient had asthma from beef or lamb liver and from the liver extract *given for anemia* but *not from* beef or lamb meat or from chicken liver. Specific allergy to other organ tissues, especially to thyroid, pancreas, pituitary, and adrenal, is discussed together with *drug and hormonal allergies. Allergy from injected or ingested* liver extracts for anemia or vitamin deficiencies is common. Since the first reports, by Matzger and Grun, many others have been published. The *possible development of allergy during liver therapy must be remembered.*

Gelatin.—Gelatin like glue is made from hides, horns, connective tissue, and cartilage of various animals. It is used in cooking, in bouillon tablets, in medicinal capsules, and in the industries. Gelatin *fails to* produce experimental anaphylaxis in animals. Wells attributed this finding to the absence of the amino acids tryptophane and tyrosin which may be necessary for the development of allergy. Or, possibly, the arrangement of the carbon atoms in a chain rather than a ring in the molecule, may prevent allergic reactivity. Clinically, occasional evidence of allergy to gelatin occurs. However, it may be due to residual traces of beef or other animal tissue used in the making of gelatin.

Fowl.—The flesh of any *domestic and game birds* may produce allergy. The flesh of the fowls most frequently eaten, such as chicken or duck, often causes allergy. As Vaughan has noted, the members of this bird family, including chicken, wild and tame ducks, goose, turkey, pheasant, squab, quail, guinea and sage hen, doves, pigeon, snipe, and many others, are rather distantly related. Thus, allergy to one is rarely associated with allergy to the others. However, sensitization to one species of chicken or duck usually means allergy to all species. The effect of the predominate feed on the allergenic activity of the flesh of these various birds is a problem which needs study, as noted on page 65.

Sensitization to the meat of a bird may be accompanied with allergy to the bird's feathers, emanations, and eggs; or feather and egg allergy may be absent, as with meats and emanations of animals discussed on page 59. Group and specific allergens exist in the feathers of all types of birds. The more closely related species probably have more common

to one or all of these may be associated with allergy to other shell fish such as oysters or clams and less often with allergy to the true (fin) fish. That the type of food these shell fish consume may influence their allergenicity is indicated by Kern's observation that a patient was allergic to lobsters north of Cape Cod and not to those from the southern coast. Similar effects from feeds in milk have been noted on page 65.

Amphibia and Reptiles.—*Frog legs* are eaten with increasing frequency and turtle meat is used in soups. These animals are distantly related to each other. Their meat may be eaten when milk, egg, or fish allergies are present. Mock turtle soup contains no turtle but is made from meats, vegetables, and spices.

Snake meat is eaten in certain areas of the world. Here in America rattlesnake meat occasionally is eaten, and may be obtained in cans, according to Vaughan.

VEGETABLES

Certain vegetables tend to produce allergy more frequently than others, though instances of allergy to almost all vegetables are not lacking. Thus, allergy occurs most frequently to lettuce, spinach, tomato, the various legumes, members of the cabbage group, onion and garlic. Vaughan described sensitizations to related species of vegetables as well as to other foods belonging to the same genus. Although group sensitizations are not the rule, they must be suspected, particularly if a marked specific allergy to one vegetable exists. Alvarez especially has stressed that indigestion may arise from irritants in vegetables or from organic causes, such as gall-bladder disease, peptic ulcer, appendicitis and other constitutional diseases As discussed on page 52, these symptoms should not be attributed to food allergy. Nevertheless the presence of abdominal disease, or of apparent neurosis does not rule out the possibility of food allergy as a major or complicating cause. Allergy may exist to several distantly related vegetables. In rare instances patients are allergic to practically all vegetables. At the same time allergy to all fruits may exist. In these cases adequate supplemental vitamin therapy and careful attempted hyposensitization with all important vegetable and fruit allergens may be attempted, as discussed on page 57. The varying denaturizing effect of heat on vegetables also must be remembered.

Onion (allium cepa) and garlic (allium sativum) belong to the family Liliaceæ and are productive of frequent and often severe allergy. It is probably more common when these foods have been eaten frequently or in large amounts, particularly in the raw state. In the colder areas of this and other countries, onions often are eaten raw like apples. Small green onions are commonly eaten. One patient became so allergic that the eating of two olives dipped in oil flavored with garlic produced dizziness, exhaustion to collapse, nausea and vomiting. These foods frequently are used as flavors in meats, fowl, fish, soups, salads, pickles, sausages, sauces, catsups, and other foods, and the patient must suspect them in any flavored or mixed foods, especially in soups, sauces, meat,

experimentation is needed to clarify these intricate interrelationships and allied problems in the allergic field. It may be that fishes and other foods eventually will be classified according to their content of group-specific allergens and not by their biological relationship based on outward and structural characteristics.

Cod-liver oil, as noted by Balyeat and Bowen and by many other allergists, causes allergic rashes, asthma, or gastro-intestinal symptoms in sensitized patients, especially children. This sensitivity gradually develops *from the continued administration, or, in some instances,* through an inherited specific propensity. About thirty species of fish, all members of the Gadies family may be used to make U.S.P. cod-liver oil. Therefore allergy may exist to one type of cod-liver oil and not to another. These oils are rich in vitamin D. Possible allergy to various oils containing vitamin D is discussed on pages 86 and 151.

Other fish oils are used because of their vitamin content in medical therapy. Halibut-liver oil is rich in vitamin A, but contains less vitamin D than cod-liver oil. Shark oil, as well as the oil from other fishes, contains much vitamin D.

CAVIAR usually consists of sturgeon roe or eggs. In America, the eggs of sturgeons, carp, shad, spoonbill, lake herring, and other fishes are used for roe Thus, allergy may exist to one kind of roe and not to another.

The incorporation of small amounts of fish or fish oils in various foods, mixed foods, and sauces, and as adulterations in certain edible oils must be remembered. Vaughan noted the small amount of fish which is contained in some catsups.

Shell Fishes (Invertebrates).—Shell fish allergy causes some of the worst clinical symptoms. Group allergies tend to develop to members of the same class or the allergy may be specific and limited to one shell fish. Skin reactions by the scratch test usually are large. Sensitization may occur also to several distantly related shell fish as to those of the Gastropoda and Crustacea, as tabulated on page 217.

The *abalone,* a gastropod, is a large snail which lives on the rocks in the ocean especially in California. The mussel is cooked as such or in chowder. The *snail* is another edible Gastropoda. It is commonly eaten in Europe, especially in Paris, and tastes and looks like a shrimp

Mussels, oysters, scallops, and clams are bivalve shell fish, belonging *to the class Pelecypoda. All may produce allergy, especially* those which are eaten most frequently in a given locality. Severe sensitizations with or without marked skin reactions may develop to these food allergens

Squid is a mollusca, a small type of cuttle fish, eaten especially in the Mediterranean area. The shell is rudimentary, and has a pen-shaped internal structure. It usually is cooked with egg, fried in oil and served with condiments.

Crab, lobster, crayfish, shrimp, and prawns are arthropods with skeletons outside, rather than inside their bodies. Group sensitizations are the rule though individual specific allergy may exist or predominate. Allergy

to one or all of these may be associated with allergy to other shell fish such as oysters or clams and less often with allergy to the true (fin) fish. That the type of food these shell fish consume may influence their allergenicity is indicated by Kern's observation that a patient was allergic to lobsters north of Cape Cod and not to those from the southern coast. Similar effects from feeds in milk have been noted on page 65.

Amphibia and Reptiles.—*Frog legs* are eaten with increasing frequency and turtle meat is used in soups. These animals are distantly related to each other. Their meat may be eaten when milk, egg, or fish allergies are present. Mock turtle soup contains no turtle but is made from meats, vegetables, and spices.

Snake meat is eaten in certain areas of the world. Here in America rattlesnake meat occasionally is eaten, and may be obtained in cans, according to Vaughan.

VEGETABLES

Certain vegetables tend to produce allergy more frequently than others, though instances of allergy to almost all vegetables are not lacking. Thus, allergy occurs most frequently to lettuce, spinach, tomato, the various legumes, members of the cabbage group, onion and garlic. Vaughan described sensitizations to related species of vegetables as well as to other foods belonging to the same genus Although group sensitizations are not the rule, they must be suspected, particularly if a marked specific allergy to one vegetable exists. Alvarez especially has stressed that indigestion may arise from irritants in vegetables or from organic causes, such as gall-bladder disease, peptic ulcer, appendicitis and other constitutional diseases. As discussed on page 52, these symptoms should not be attributed to food allergy. Nevertheless the presence of abdominal disease, or of apparent neurosis does not rule out the possibility of food allergy as a major or complicating cause. Allergy may exist to several distantly related vegetables. In rare instances patients are allergic to practically all vegetables At the same time allergy to all fruits may exist In these cases adequate supplemental vitamin therapy and careful attempted hyposensitization with all important vegetable and fruit allergens may be attempted, as discussed on page 57. The varying denaturizing effect of heat on vegetables also must be remembered.

Onion (allium cepa) and **garlic** (allium sativum) belong to the family Liliaceæ and are productive of frequent and often severe allergy. It is probably more common when these foods have been eaten frequently or in large amounts, particularly in the raw state. In the colder areas of this and other countries, onions often are eaten raw like apples. Small green onions are commonly eaten. One patient became so allergic that the eating of two olives dipped in oil flavored with garlic produced dizziness, exhaustion to collapse, nausea and vomiting. These food frequently are used as flavor ...
sausages, sauces, catsups, ...
them in any flavored or ... especially in soups, sauces, meat.

experimentation is needed to clarify these intricate interrelationships and allied problems in the allergic field. It may be that *fishes and other foods eventually will be classified according to their content of group-specific allergens and not by their biological relationship based on outward and structural characteristics.*

Cod-liver oil, as noted by Balyeat and Bowen and by many other allergists, causes allergic rashes, asthma, or gastro-intestinal symptoms *in sensitized patients, especially children. This sensitivity gradually* develops from the continued administration, or, in some instances, through an inherited specific propensity. About thirty species of fish, all members of the Gadies family may be used to make U.S.P. cod-liver oil. Therefore allergy may exist to one type of cod-liver oil and not to *another. These oils are rich in vitamin D. Possible allergy to various* oils containing vitamin D is discussed on pages 86 and 151.

Other fish oils are used because of their vitamin content in medical therapy. Halibut-liver oil is rich in vitamin A, but contains less vitamin D than cod-liver oil. Shark oil, as well as the oil from other fishes, contains much vitamin D.

CAVIAR usually consists of sturgeon roe or eggs. In America, the eggs of sturgeons, carp, shad, spoonbill, lake herring, and other fishes are used for roe. Thus, allergy may exist to one kind of roe and not to another.

The incorporation of small amounts of fish or fish oils in various foods, mixed foods, and sauces, and as adulterations in certain edible oils must be remembered. Vaughan noted the small amount of fish which is contained in some catsups.

Shell Fishes (Invertebrates).—Shell fish allergy causes some of the worst clinical symptoms. Group allergies tend to develop to members of the same class or the allergy may be specific and limited to one shell fish. Skin reactions by the scratch test usually are large. Sensitization may occur also to several distantly related shell fish as to those of the Gastropoda and Crustacea, as tabulated on page 217.

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[illegible] the Mediter- [illegible] al structure. [illegible]

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fowl and fish. Wild onion and garlic eaten by cows flavor their milk and may cause possible allergy from the milk and butter. As with other food allergies, all degrees of susceptibility exist so that traces of these foods may not produce allergy in one patient but may result in extreme symptoms in another.

LEEK (allium porrum) was used in Roman days, and possibly originated in Switzerland. Cooking decreases its pungent odor and taste. It is used, especially in France, like asparagus. The leaves are incorporated in soups, salads, and other foods as flavoring.

CHIVES (allium schœnoprasum) came from Syria and are grown in Europe and America. The small red button is used to flavor soups, salads, meats, and stews.

Asparagus (asparagus officinalis) also belongs to Liliaceæ but to a different genus than the above vegetables. It probably originated in the Caucasian region and was used in the early Christian era. The rapidly growing sprout from the root is eaten. It is white when it is covered by the ground, and becomes green above the ground. In Europe, the roasted seeds are used as a substitute for coffee and the root is made into a fermented drink. Vaughan mentioned yucca, or Spanish bayonet, which is indigenous in the dry Southwest. The cluster fruit has a thick, tender covering which is palatable when cooked.

The Beet Family (Chenopodiaceæ).—The beet (beta vulgaris) was first eaten during or before the 16th century. The young green leaves are boiled and seasoned and eaten as greens. The esculent enlarged root is favored as a vegetable either hot or cold in salads, or preserved with spices and vinegar. Allergy to all these forms is a possibility.

The *sugar beet* was first used as a source of cooking sugar in about 1800. It now furnishes a large amount of the world's supply of sugar. Allergy to both beet and cane sugar or to either may occur, as noted on page 62.

Chard, sea kale (beta cycla) first developed in Africa and was used by the Greeks and Romans. The leaf is made into salads or may be cooked as greens. The stem and the moderately fleshy root from which the beet was developed may be eaten as such

Spinach (spinacia oleracea), a member of Chenopodiaceæ, belongs to a different genus than beet and chard. It originated in southwestern Asia and was used first in the 14th century in Europe. It is a valuable leaf vegetable, containing several important vitamins. (See note, page 201.) Vaughan noted that New Zealand spinach and mountain spinach are not related to true spinach. *Orache* is an atriplex and is distantly related to ordinary spinach.

In discussing possible allergy to these foods, it must be pointed out that the pollens of many weeds which belong to this family, including the atriplexes, goose foots, Russian thistle, pig weeds, pickle weed, and sugar beet, are common causes of allergy.

The Cabbage or Mustard Family (Brassicaceæ).—The many vegetables which constitute this group are related botanically. They probably have a common origin but have differentiated themselves according to climate and soil influences. Clinical allergies to several members of this

group indicate that group allergens probably exist. On the other hand, specific allergens also are found in each one. Pronounced allergy to one or two vegetables of this group should bring the others under suspicion Different parts of these plants are eaten. Thus, the seed of mustard, the leaves of cabbage, the abortive flower of Brussels sprouts, the enlarged stem of kohlrabi, and the large tap root of rutabaga and turnip are used.

CABBAGE AND KALE OR COLE (brassica oleracea) were used by the Egyptians, Greeks and Romans. The firm head cabbage was developed in more recent times. Kale has open-grow
or borecole has give
What is called col
pepper are added.
yeast

COLLARDS (brassica oleracea acephala), especially grown in the South, is a variety of kale The leaves form in tufts which are cooked for food. The young leaves of cabbage also are called collards.

CAULIFLOWER (brassica oleracea var. botrytis) is a kind of kale in

plants which develop small cabbage sprouts along the large stems.

KOHLRABI (brassica oleracea var. caulo-rapa) seems to have developed from a cross between cabbage and rape, a type of turnip fed to stock. The name has arisen from kale which, as noted, is a loose growing cabbage or rape. Kohlrabi is similar to turnip but grown above the ground as a fleshy stem.

MUSTARD (brassica nigra), known since ancient times, is grown for its seed In the Western States, another variety is a rank-grow

usually contains mustard seed, vinegar, water, and flour and possibly other condiments. The cooked leaves of white mustard are used as greens.

RADISH (raphanus sativus) originated in China and was used by the Egyptians and Greeks It is related to the cabbage group of vegetables and is used as an hors-d'œuvre and a relish
w
to
gr
condiment for meats and in salads.

Legumes (Leguminosæ).—The various legumes are extensively used for food all over the world. Allergies to them are quite frequent. Often they occur to many in this group and less frequently to specific ones. As with all food allergies, sensitizations to these foods may produce manifestations in various tissues, as discussed in Chapter III. The high content of protein makes legumes important in nutrition. The writer agrees with Vaughan that peanut most commonly produces allergy, which often is severe and is associated with good scratch reactions.

LENTILS (lens ecculenta) were raised in ancient days by the Egyptians and Hebrews and are still used as food, especially in Europe.

Beans (phaseolus) constitute an important, widely used food. Lima beans which originated in Brazil, are grown extensively in the Americas. Kidney beans originated here in America and are grown in several species—the haricot in France, the frijole in Mexico, the white, navy and red beans in this country, and other varieties in other countries. The pod of the string bean is eaten before the beans mature. The Chinese eat the sprouts, especially of the Mung bean, before the leaves appear. Various flours are prepared from different beans, especially from the lima bean in California.

Soy (Soja) Beans (soja max) originated in China and have been used there, and recently here in America, as a food. Because of the high protein and fat and the low starch content, as well as the presence of all important amino acids, man's protein requirements can be met by these beans. Soy bean products low in starch are used in diabetic foods. Its flour combined with lima bean or potato flours is incorporated with other ingredients to make cereal-free bakery products in the elimination diets. Ordinary soy and lima bean breads, however, contain wheat and often milk. It is also used in a special formula as a substitute for milk in infant feeding, as described on page 182. The Chinese use soy beans to make a cheese called tofa, a brown sauce called soy, and a milk by mixing the flour with water. They also utilize soy in noodles, in meats, and in other foods.

Duke noted the definite tendency to soy bean allergy. Sensitization to other legumes was present in some of his patients. He listed the various food products which at times contain soy bean, and again showed the importance of knowing all ingredients in all commercially prepared foods. Thus soy bean may be present in cakes, bread, muffins, crackers, macaroni, and noodles, in breakfast, diabetic, and allergic foods, in confections, in sausage, in some condensed milks and in coffee substitutes. Oil from soy beans is used in making many commercial products, such as paints, varnishes, lubricants, linoleum, water-proof goods, soaps, celluloid, and printer's ink.

Peas (pisum) have been grown and eaten since earliest times and are eaten as a green vegetable. The dried, split peas, because of their protein content are helpful in milk- and egg-free diets and may be used in a puree, as a hot or cold drink, or in soups, as described on page 157.

Peanut (arachis hypogæa) originated in tropical America. It develops in the pod on the flower stalk which has gradually bent toward the ground and finally worked itself into the soil. Some call it the ground pea. It is not a nut. It has been used as a food since the Civil War, and is now used in large amounts roasted, in the pods or shelled, in candy, cakes and breads. Peanut butter is exceedingly popular in America. The flour is used in bread, especially in Europe. Peanut oil as such, or as an adulterant in other salad oils, is in common use.

The Carrot Family (Umbelliferæ).—These plants thrive in the temperate areas The leaves, stalks, roots, and seeds are used in salads and as vegetables, garnishes, flavors and spices. Many of these vegetables are important sources of vitamin A.

Carrots (daucus carota) originated in Europe and in the middle ages were grown in Asia and India. Only the wild plant was used by the Greeks. They may be eaten raw or cooked. Carrot marmalade is acceptable to allergic patients, as described on page 240.

Celery (apium graveolens) was first grown in Europe. In ancient times it was used as a medicine, the assumed rapid action of which possibly accounts for its name. The stalks and fleshy stem and root may be eaten raw or cooked, in salads, as vegetables, or in soups. The leaves may be used to garnish food or made into celery salt.

Parsnips (peucedanum sativum) came from Europe. Formerly they were used as a medicine. The root has been eaten as a vegetable for several centuries.

Parsley (carum petroselinum) is indigenous to Europe. It was eaten by Greeks and Romans, and was first used in England in the 16th century. It is used as a seasoning in soups and to garnish foods. The wild "fool's parsley" is poisonous. The Hamburg tulip-rooted parsley is eaten and is the size of a small parsnip.

Fennel (fœniculum vulgare) looks like asparagus. The leaves may be used to [illegible]

[illegible] made from it. Oil of anise is a favorite flavor for candy, cake, cookies, gum, dentrifrices, and mouth washes.

Dill (anethum graveolenes) was used already in Roman times. The seeds flavor sausage and pickles. The leaves taste like mint or fennel.

The Potato Family, (Solanaceæ).—The various members of this family used as foods are related to white potato, which already has been described on page 62.

Tomato (lycopersicum esculentum) was first cultivated in Central and South America, was taken to Europe and, about a hundred years ago was first used as a food in our country. Its vitamin content and flavor have increased its popularity. It is used fresh in salads, cooked as a vegetable, in sauces and as flavors for soups and pastes, especially in Spanish or Mexican foods. Tomato juice in cans or bottles is a good beverage.

Peppers (capsicum annuum) originated in the Americas. Many varieties are grown now all over the world. Red pepper, cayenne pepper, paprika and tabasco all come from varieties of capsicum, while the black and wh [illegible]

[illegible] (solanum melongena) is somewhat egg-shaped and grows like a berry on a plant. It probably originated in India, and has been eaten in Europe, Asia and China since the 7th or 8th century.

The Gourd Family (Cucurbitaceæ).—Allergies to all members of this group and to individual members occur as with other closely related [illegible]

[illegible] were first grown in Asia at least three thousand years ago, and they have been used increasingly ever since. They are picked green,

and treated with vinegar and spices to make pickles. Dill pickles are preserved with brine and dill. (See page 77.) Gherkin is a cucumber found in Jamaica but other cucumbers which are used for pickling are also so named.

WATERMELON (citrullus vulgaris), found first in Africa, has been extensively cultivated in America.

CANTALOUPE OR MUSKMELON (cucumis melo) was first popular in the Renaissance.

Many new melons such as the *Cassaba, Persian* and *Crenshaw* melons may produce specific or group allergies.

Rhubarb (rheum rhaponticum) and buckwheat (see page 63) are members of the buckwheat family. Rhubarb first was known in Asia. It was eaten in Italy in the early 17th century, in England two hundred years later, and was in use in America in the early 19th century. The oxalic acid content of the leaves makes them dangerous as foods.

Okra—Gumbo (hibiscus esculentus) is related to cotton and belongs to the mallow family. It originated in Africa. Its long pods may be eaten especially in soups to which it imparts a mucilaginous character. Vaughan reported that urticaria resulted from handling okra and gastrointestinal symptoms from eating it.

The Thistle Family (Compositæ).—This family is an extremely large one since it comprises 10,000 or more species. Most of these are herbs, but some are shrubs and tropical trees. Group or crossed-sensitization may exist, especially in closely related species.

LETTUCE (latuca sativa) originated in Europe and Asia and was used by the Greeks, Romans and Persians. Head lettuce has been grown for four hundred years

SALSIFY OR OYSTER PLANT (tragopogon porrifolius) has a fleshy root with an oyster-like flavor. It is boiled, fried and used in salads or as a relish. *It was first* used in Europe in the 16th century.

ENDIVE (cichorium endiva) originated in India, and was eaten by the Greeks and Romans Its leaves are used in salads.

CHICORY (cichorium) was first grown as a vegetable in the 16th century. The leaves *are used in salads, the young roots are cooked as a vegetable and the older* roots, dried and ground as a coffee substitute or adulterant. A volatile oil produced by roasting yields an aroma.

ARTICHOKE (cynara carduncuIus) is a large thistle-like plant which is cultivated for its flowering heads. The soft inner surface of the leaves and the heart or bore of the flower heads are cooked, and used as a salad or vegetable. The canned hearts are used likewise.

[illegible] belongs to the sunflower family. [illegible] Vaughan stated, was corrupted [illegible] root which resembles the potato is sweetish, is low in calories, and may be boiled, pickled, or eaten uncooked.

DANDELION (taraxacum) is grown in Europe, especially in France, for its edible young leaves which are used in salads or boiled as greens.

Fruit.—*Allergy may be specific to individual fruits or to biologically related fruits such as the citrus fruits, or it may exist to allergens common to practically all fruits.* Possible sensitization to many or to all fruits must be considered in urticaria, angioneurotic edema, gastro-intestinal allergy and less frequently in allergic arthritis, cerebral allergy and allergic toxemia, as discussed in Chapter IV. For patients in whom

allergy to all fruits is suspected the *fruit-free elimination diets* on page 168 are available. Certain patients can take cooked and not raw fruits. Some are sensitive to the skins and not to the meat of the fruit.

Citrus fruits (rutaceæ) probably had their common origin in southeastern Asia The outside skin has developed from modified leaves which united and entirely enclosed the berry-like fruit. They are cultivated extensively in warm areas in which freezing temperatures are rare.

ORANGE (citrus sinensis) was first cultivated in Europe in the 16th century. It is raised extensively in the Southern States, especially in Florida, Texas, Arizona and California

Orange oil from the rind, which is produced primarily in Sicily, is used in perfumes, soaps and flavors. Contact allergy to orange oil, especially on the hands, is not uncommon, as noted on page 89. Allergy to a dye used on the green skin of the fruit may produce allergic dermatitis on the hands.

Sugar Orange, *Seville*, sour, bitter or brigrande orange, was the first orange brought to Spain by the Moors in the 8th century. Being bitter and sour, it is used only in marmalade, in candied or glaced peel or for its oil.

Orange blossoms are used to flavor some drinks in South America. The pollen from the blossoms may produce allergy.

TANGERINE (citrus nobilis var deliciosa) is a small orange which originated in China

LEMON (citrus limonia) was brought to Europe by the Arabs. It usually is picked green and ripens gradually in [illegible]

the o [illegible]

GR [illegible]

or re [illegible]

It wa [illegible] 18th century. Its name arose because it grows in clusters At the present time it is cultivated mainly in America.

LIME (citrus aurantifolia) is similar to lemon. It is used in candies and beverages, and as a flavor.

LIME [illegible]

KUM [illegible]

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serves, [illegible]

CITRON (citrus medica), originated in India or Southern China, from where it was taken to Arabia and Syria and finally to Rome. The rind is used in candies, preserves, cakes, and puddings. The oil of citronella comes from the sweet Ceylonese grass

BERGAMOT (citrus bergamia) oil has been used since the 17th century in perfumes.

The Apple Family (Pomaceæ).—Allergy to these fruits is not uncommon Apple is the most common offender. Group and more often specific allergies occur Apple [illegible]

America, Europe, and other cc [illegible]

was raised by the Romans and [illegible]

Europe Vaughan has observ [illegible]

therefore has substituted whit [illegible] (see page 81.) Apple butter is made of concentrated cooked apple flavored with cider or vinegar, with sugar, and with spices An imitation contains cornstarch, citric acid and apple oil.

Pectin, which [illegible]

the rind of [illegible]

CRAB APPLES (malus coronaria), one variety of which, native in America, ar another in Siberia, have a sour acrid taste. Therefore they are commonly used i jellies and preserves. The edible apple in its many varieties originally came fro hybrids of the crab apple.

QUINCE (cydonia) originated in southern Europe and western Asia. It is unplea ant to eat raw, but is delicious cooked in jellies and jams. It contains a large amour of pectin.

PEAR (pyrus) first was grown in Europe and western Asia. Today many varietie are grown in the temperate areas of the world. *Allergy to pear may be associate* with allergy to apple and to other members of this group.

The Plum Family (Drupaceæ).—These so-called pit fruits are closel related. Allergy may exist to several or to individual ones. In th almond the meat of the pit develops and is eaten instead of the flesh Most of these fruits are sold fresh, dried, or canned. They may be drie in the sun or in dehydrators. Sulphur usually is added as a preservative

APRICOT (prunus armeniaca) is indigenous in Arabia, Armenia and western Asia It was first cultivated in England in the 16th century, and now is grown in th temperate regions of the world.

PEACH (prunus persica) was grown in China as early as the 10th century B C Later it was brought to Asia Minor, Greece, Rome and Europe. Its assumed origi in Persia *accounts for the name peach. Vaughan stated that approximately* thousand varieties of peaches have been developed.

NECTARINES have been grown and eaten for four hundred years. They hav smooth skin and have developed by bud variations of peaches. Peaches and nectar ines may grow on the same tree.

ALMOND (prunus amygdalus) originated in Asia and North America. It is similar to the pit fruits The meat of the pit is eaten, while the fleshy part is thin and tough

The pits of almonds, apricots, peaches, and cherries are ground, fermented an distilled to produce *almond oil.* Another product is hydrocyanic acid which i destroyed by lime and copperas. Prussic acid poisoning has resulted from the ingestion of the pits of wild cherries, bitter almonds, and peaches.

PLUM (prunus) originally was grown in the Caucasus Many varieties now are grown in temperate areas and often are designated by regional names Plums have been eaten for at least two thousand years. Prunes are a variety of plum which *is dried without removing the pits*

CHERRY (prunus avium) also developed in the Caucasus from where it was taken to southern and then to northern Europe and to America. Many cultivated varieties originated from prunus cirasus and avium of Europe. Sour cooking cherries came from the Cirasus. Hybrids of the two species also have been developed. Cherries vary in color from black to red and yellow. *Maraschino cherries* originally were preserved in a liqueur distilled from the marasca cherry. Imitations are common

The Mulberry Family (Moraceæ).—The breadfruit (see page 63) and hops (see page 87) belong to this family as well as the two following fruits.

MULBERRY (morus) grows on trees of several varieties Silk-worms in China and Japan feed on the white mulberry. The black mulberry originated in and near Persia. It bears an edible fruit Vaughan suggested that the fruit of the red mulberry, *a native of North America, be eaten more by allergic patients* It may be taken raw or cooked with such fruits as apples or rhubarb.

FIG (ficus carica) was known in Syria and the nearby area in ancient times. Several varieties are grown in the Southern States, especially in California.

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The following four fruits are important but they are not related botanically.

PINEAPPLE (ananas sativua) originated in tropical America. *It is widely cultivated* in tropical countries, especially in Hawaii, Philippines, China, India, Java, and Africa. It is eaten fresh or canned. The canned juice is widely used. Pineapple allergy is not uncommon.

BANANA (musa) has grown in torrid zones even in prehistoric times. Many varieties are known. The overlapping and tall upright leaf stalks grow from the ... With each harvest, this trunk is cut down and

[illegible]

for every fifty to one hundred female trees. Various species of the date palm yield dates of different sizes and consistency. This nourishing fruit may be eaten raw or dried. It is made into flour, oil, and wine in Arabia Dates grown in Southern California are gaining favor in America.

JUJUBE (zizyphus Jujuba) is a Chinese date brought from India over a thousand years ago Another variety grows along the Mediterranean and in California and Florida.

The Grape Family (Vitaceæ).—Allergy may exist to one species of grape and not to another or to the skin and not to the meat of a grape. As with all foods, group sensitizations to all grapes may also occur.

WILD GRAPES (vitis) grow throughout the world By careful cultivation and selection, various edible varieties have been developed. The wine grape originated in Asia probably ...

[illegible]

... has all been fermented into alcohol; in sweet wines, the fermentation has been stopped by the addition of alcohol before the grape sugar has all been converted. Red wines are colored by the skin White wines are made from white grapes or from colored grapes from which ...
the making of wine
a district in France
to apple vinegar.
pared from dilute a... acid may be used.

THE GOOSEBERRY FAMILY (GROSSULARIACEÆ).—CURRANT (ribes rubrum) was developed in northern Europe five or six hundred years ago. The red currant was brought from Europe to America. The Buffalo currant originated along the Missouri and Columbia rivers and is cultivated in Utah. Several other varieties are raised. The berry is small and has a tart flavor. It is used in jellies and preserves. The dried currants on the market, are not real currants, but are dried small seedless raisins from Grecian Islands.

GOOSEBERRY (ribes grossularia) originated in Northern Europe. It was first cultivated in the 16th century. A native gooseberry also grew in New England. Gooseberries are used extensively in England where a large variety grows. Jellies, jams, preserves, pies, and sauces are made from them.

The Rose Family (Rosaceæ).—These berries which are commonly used as foods, are related to roses and grow wild all over the world. During the last century, through cultivation, various species have been developed to yield larger and more delicious fruit.

STRAWBERRY (fragaria) was so named because of its closeness to the ground as though it were strewed thereon. Many patients suffer from urticaria due to this berry, and skin reactions often are absent. Usually allergy to other fruits exists. Lyon, as noted by Vaughan, observed instances of strawberry allergy in four generations. (See page 76.)

RASPBERRY, BLACKBERRY, LOGANBERRY, DEWBERRY, AND YOUNGBERRY (rubus) are closely related. All are eaten raw or cooked in preserves, jellies, jams, frozen desserts, or pies. The juices are used as flavors or in beverages.

The Huckleberry Family (Vacciniaceæ).—Vaughan stated that members of this family grow from the tropics to the arctic areas, and include winter greens, teaberry, Labrador tea, rhododendron, azalea and trailing arbutus. Among them are two important berries.

HUCKLEBERRY, BLUEBERRY AND BILBERRY are indigenous to North America and were eaten by the Indians. They are used in preserves and pies.

CRANBERRY (vaccinium macrocarpon) is a native of North America The large type grows wild in bogs in the northern and eastern states and is cultivated in Wisconsin, and especially in Cape Cod and New Jersey. The unopened flower resembles the head, bill, and neck of the crane, thence the name.

Miscellaneous Fruits.—Tropical fruits and those of other countries gradually may be of value to the allergic patient, particularly if allergy exists to several of the commonly used fruits.

GUAVA (pisidium guajava) grows in tropical America The fruit looks like an orange and is used especially in jelly.

MANGO (curcuma amada) grows in most warm areas as in Mexico, Florida, and the West Indies. It varies greatly in size, and may be as large as a cantaloupe. Raw, canned, or preserved mango is eaten.

AVOCADO or alligator pear (persea gratissima) is a native of tropical America. It is now grown in all warm and tropical areas. The tree is a member of the Laurel family to which the trees yielding cinnamon and bay leaves belong.

PAPAYA (papaw) (carica papaya) grows on a tree in tropical America. It usually is eaten raw but may be boiled or preserved.

PERSIMMON (diospyros virginiana) is a plum-like fruit which is astringent until it is ripe.

POMEGRANATE (punica granatum) originated in tropical Asia and Africa. It is a berry-like fruit as large as an orange with many seeds in a crimson edible pulp.

Vaughan called attention to various fruits obtainable in Florida and New Orleans such as *mandarin, sapodilla, shaddock, chocho, monistera deliciosa, cherimoya or custard apple, carambola or star apple, prickly pear, kumquat, plantain, carissa, and tamarind.* He stated: "The State of Florida, Department of Agriculture, Bulletin No 46 (1935) gives a list of various tropical and subtropical fruits grown there. The Agricultural Extension Service, Gainesville, Florida, Bulletin No. 85 (1936) contains many photographs and botanical descriptions of such fruits."

Nuts.—Allergy to nuts is quite frequent, especially to those closely related. As already noted, the peanut (see page 76) and the almond (see page 80) are not nuts.

Walnut Family (Juglandeæ).—The *English walnut* originated in southwestern [illegible] percentage of [illegible] California The [illegible] this country. [illegible] walnut oil, which [illegible] Walnuts are frequ[illegible] festations In Cal[illegible] trees pollinate pro[illegible] cutaneous allergie[illegible] of the frequency of allergy to black walnut pollen, it is unwise to plant these trees for shade.

Pecan (carya olivæformis) is indigenous in Texas and the lower Mississippi Valley. It is more closely related to hickory than to walnut.

Hickory (carya alba) is a native of this country.

Beech Family (Fagus).—Beech Nuts (fagus ferruginea) are triangular, small and occur in pairs In France, a coffee substitute is made from the roasted nuts and in Germany salad oil and butter substitute are made from the oil.

Chestnuts (castanea) originated in southern Europe and in Asia. Vaughan stated that chestnuts are an important food in certain districts in Southern France, Italy, and Spain The nuts are ground into flour, and used in bread and desserts. One variety of chestnut is indigenous to America along the eastern coast and in the adjacent northern states. The *chinquapin* is a small variety which grows in the southern states.

The *marron* is a large variety from France and Italy and is preserved or sugar-coated. Roasted nuts of all varieties are favored.

The *horse chestnut* is bitter, but it has been used as a coffee substitute and in soups and gruels by Indians.

Filbert, Hazelnut, Cobnut (corylus) originated in Asia Minor and Europe and has been eaten since ancient times The nuts are used as a source of oil in Russia. The hazelnut is indigenous in North America.

The following nuts are unrelated:

Brazil Nuts or Niggertoes (bertholletia excelsa) come from a tropical tree of South America. The triangular nuts, usually twenty or so, fit into one large shell. This nut is not related to other foods

Acorns (quercus esculus), used by the Indians, are still eaten in southern Europe.

Cashew Nuts (anacardium occidentale) originated in central and tropical South America and now are grown in other tropical areas. They are not related to other nuts or common foods. Vaughan reported asthma and urticaria from this nut

Cocoanuts (cocos nucifera) grow on a palm in the tropics of the Pacific and Indian Oceans The meat may be eaten as such, or grated and used in cakes, frostings, candies, and desserts The milk is fairly palatable. The oil may be used in salad oils, oleomargarines, soaps and other commercial products.

Litchi Nuts (litchi chinensis) come from a Chinese tree, which is now grown in the East Indies and India The fruit has a hard covering, a soft white meat

and a hard small, dark seed. The dried fruit yields a black sweetish meat. One patient had allergic headache and gastro-intestinal symptoms from this food. The canned meat of the nut is available.

Pine Nuts are eaten in many countries, especially in the Himalayas, where the ground product is mixed with flour.

Fungi.—The following fungi and yeasts are used as food or occur in various foods.

Mushrooms, as Vaughan stated, are the fruit of a fungus which grows on the mycelium in the ground. Twelve or more varieties are edible. They are eaten as such and are used in sauces, soups, gravies and in other food mixtures. Severe allergy, usually in the alimentary tract, may occur to mushrooms.

Truffle grows in the ground without roots or upward shoots in Europe, especially in France and also in California. Its pleasant odor is recognized by trained dogs and by hogs. It is used as a condiment in pâté de foie gras and in sausage. It is marketed in cans, and can be used in place of mushrooms when allergy to the latter exists.

Puffballs, if they are edible, have a flavor similar to mushrooms but are not eaten much in this country.

Molds at times occur in cheeses (see page 67) and in certain fermented drinks used in Japan.

Yeast is used in raised bakery and in other food products, such as fermented beverages, and certain cheeses. In recent years much yeast has been ingested because of its vitamin content and heralded medicinal virtues. Allergy to yeast is common and skin testing with important varieties of yeasts should be routine. The regular pound cake or baker's yeast is pure. The yeast cakes often contain a little tapioca and at times carotene in cottonseed oil because of its vitamin A content. In cases of allergy to cottonseed its possible presence in yeast cakes should be considered. Yeast allergy has been discussed on page 60

Beverages.—The content of commercial beverages such as *beer, wine whiskey, coca cola, root beer and similar drinks* is given on page 221.

Coffee (caffea arabica) is indigenous in Abyssinia from where it was brought to Arabia in the 5th century. It was shipped from Mocha to Italy, Turkey, and later to England where coffee houses became popular. The modern word "cafe" is thus explained. Since the 17th century, coffee has been raised in Java, Central America, the Indies and in Brazil. The roasting of the coffee bean releases a volatile oil, coffeol, which gives the aroma and flavor to coffee. The bean becomes lighter and brown in color. *Allergy to coffee is not uncommon.* It may be responsible for [illegible]

[illegible]

to America. A cup of tea contains about 1 to 2 grains of caffeine, about equal to that in a cup of coffee. Whether allergy to one species of tea and not to others exists is not known. Allergy to tea itself exists but is less frequent than to coffee.

Chocolate (cocoa) (theobroma cacao) originated in Mexico, tropical South [illegible]

[illegible]

the flavor. The final product is an oily, dark, bitter fluid. Sweet chocolate contains cocoa butter and sugar. Condensed, powdered milk is added to milk chocolate.

COCOA has less oil and cocoa butter than chocolate. *Cocoa butter* is used in [illegible] Vaughan reported derma- [illegible] ocolate-sensitive patient.

[illegible] azilian tea It grows on a species of holly. Vaughan stated that [illegible] 20,000,000 pounds yearly.

ELDERBERRY (sambucus nigra) is the fruit of a tree and is used to make elderberry wine and to color port wine in Portugal. It is a member of the honeysuckle family and other edible foods are not related to it.

Spices and Condiments.—Allergy to one or more spices may occur. Allergy to pepper, cinnamon, peppermint, wintergreen, and mustard is common. The occurrence of various spices and condiments in commercial foods is shown on page 226.

PEPPER (black and white) (piper nigrum) grows on a climbing plant which is native in India, the East Indies, and the surrounding tropics. No closely allied plants yield food It was used in Roman days. The unripe, dried, small berry makes black pepper. White pepper comes from the inside of the berry after the outer shell has been removed. Pepper allergy is not unusual. Peppers (capsicum) are discussed on page 77.

VANILLA (vanilla planifolia) comes from dried pods 6 to 10 inches long which grow on a climbing orchid vine. It is native in Mexico, but now is grown in most tropical areas The extract is an alcoholic extract of the bean. Imitation extracts are made with synthetic vanilla.

N[illegible] trop [illegible] a pe[illegible]

A[illegible] comes from the unripened dried seed of a tree which is cultivated in the East Indies.

CLOVE (eugenia caryophyllata) is derived from the tight bud of an evergreen tree indigenous in the Dutch Indies. It is grown in Africa and the East and West Indies. The oil of cloves is used in cooking.

CINNAMON (cinnamomum cassia) is the inner bark of a tree of the laurel family which originated in Ceylon.

BAY LEAVES (laurus nobilis) are derived from another tree of the laurel family which is native in the countries around the Mediterranean and in our Southern States. They are not related to the bayberry from which bay rum is distilled.

SAGE (salvia officinalis) leaves grow on a shrub, a member of the mint family. They are used in dressings of meats, fowl, and to flavor sausages, meats, soups, cheese, and sauces.

THYME (thymus vulgaris) leaves also grow on a shrub of the mint family and are used in dressings, sauces, and meats.

MINT (mentha), including peppermint, spearmint, and pennyroyal, are used as flavors. The oil is extracted from the leaves. Mint leaves are also used to season meats.

PEPPERMINT (mentha piperita) oil comes from the dark green leaves and flowers of the aromatic mint. Essence of peppermint is a solution of this oil in alcohol.

SPEARMINT (mentha spicata) is a common garden mint used as a flavor which resides in its aromatic oil.

SAVORY (micromeria juliana) is an herb indigenous in the countries bordering the Mediterranean. It belongs to the mint family. The leaves are used for seasoning.

WINTERGREEN (gaultheria procumbens) is a North American herb whose leaves yield the aromatic oil which contains methyl salicylate. Thus, the synthetic salicy-

late or birch oil usually is sold as oil of wintergreen or gaultheria oil. Birch belongs to the Beech family discussed on page 83.

TARRAGON (artemesis dracuncillus) is an aromatic sage used for seasoning. It flavors a certain brand of vinegar.

[illegible] The oil derived from them [illegible]

Mustard and *horseradish* have been discussed on page 75.

LICORICE (hedysarum mackenzii) comes from the dried root of a plant native in Russia and Central Asia, which is related to the legumes. It is used in candy, tobacco, in certain liqueurs and porter and to flavor foods.

Fennel, caraway seeds, aniseed and dill have been described on page 77.

GINGER (zingiber officinale) is the root or root stock of a plant which grows tall leaves each year. It grows in moist, tropical regions in the West Indies, Africa, and the East Indies. It is used in ginger ale, candies, and spiced meats and sauces Jamaica ginger is its alcoholic extract. The ingredients of ginger ale are listed on page 221.

Oils.—Allergens in various oils [illegible] Therefore care must be taken in pr[illegible] who are suspected of food allergy. [illegible] oils such as those used as vehicles for hormones or drugs which are injected parenterally. *What kind of oil is used in these preparations* should be printed on the label so that the physician may select the type of oily vehicle. Estrogens in water suspension recently are available.

Cottonseed Oil (gossypium) is expressed from the seeds of cotton. It is used in salad dressings and mayonnaise. It may be an adulterant of olive and other oils. When it is hydrogenated, it forms a solid fat, which is sold as Crisco, is mixed with lard in Snowdrift, and is used with other fats to make oleomargarine. It is added to canned fish and is used in certain soaps. It is used more often than any other in this country for frying meats, potato, potato chips and other food and in bakery products.

Sensitization to the cottonseed allergen, especially by inhalation (see page 48), may be as severe as any encountered. Cottonseed flour may be used in bakery products, especially as a filler during the present war, by some concerns. Clinical symptoms may arise from the allergen in the oil or shortening in food according to the experience of the writer and of other allergists. Dr. Mayo's allergy to cottonseed and its oil is a classic example. As previously stated, symptoms also may arise from the intramuscular or intrarectal injection of the oil when it is combined with drugs or hormones. (See page 867.) Nuts that have been blanched or treated with this oil may cause allergy. Vaughan noted the variation in the fats and oils used in commercial salad oils and shortenings. He found 189 brands which contained cottonseed oil with other fats.

OLIVE OIL is pressed from olives (see page 87) which are grown in California, France, and Italy. Virgin oil comes from the first pressing. The second pressing yields so-called "foots," which is used in soaps and as a *commercial oil*. Much imported olive oil is adulterated with cottonseed, tea seed, corn, peanut, or sesame [illegible] may contain any of these oils.

Peanut oil, corn oil, cocoanut oil and walnut oil have been discussed previously.

MISCELLANEOUS FOODS

Olives (olea europæa) grow on trees especially in the Mediterranean area and in California Green and ripe olives are pickled with brine and vinegar, and

oil allergy.

beer dates

... varieties of the maple tree (aceraceæ saccharinum). The rock or sugar maple which is indigenous in New England yields much sugar. Most commercial maple syrups contain cane or corn sugars. However, some pure maple sugars and syrups are on the market.

Karaya Gum (sterculi aceæ) is made from the bark of a tree of the Astragalus species Sometimes it is called Indian tragacanth or sterculia gum It belongs to the

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tained ... nitrogen. Inhalation allergy to karaya gum is discussed on page 44.

Karaya gum, according to Bullen and Figley, is included in gum drops, jelly beans and other soft-center fillers, in ice cream, ices, and in ice cream powders, in certain diabetic and health foods, in certain brands of junket and gelatin, in fillers for various pies, in flavor emulsions, and in some salad dressings. Furthermore, it is contained in various hand lotions, in wave-setting solutions (as discussed on page 44), in tooth pastes (such as Listerine and Lactana), in denture adhesive powders (such as Dr Wernet's powder, Dent-a-Firm, Denture powder and Stix), in many laxatives (such as Karaba, Karabim, Saraka, Mucara ... Bassoran), and in the wrappers of

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Vaughan found an iodin

Irish Moss

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Gum Acacia or Gum Arabic (see page 44) comes from several species of acacia trees and is composed chiefly of calcium, magnesium, and potassium salts of arabic acid. It is used in adhesives, inks, confections, especially lozenges, and medical emulsions, and may be injected intravenously.

Psyllium Seeds, which are used frequently as a cathartic, may produce allergy and cause various allergic manifestations.

Honey produces severe allergy especially in the gastro-intestinal tract. Pollen or the allergens of the bee itself in the honey also might cause specific symptoms.

DYES, DRUGS AND CHEMICALS

Dyes which are used to color foods, candies, gelatins and drinks, may produce various manifestations of allergy. Thus, Baer reported dermatitis and cramping in the abdomen from a green dye in gelatin (see page 26). *Phenolphthalein* is responsible for the pink color in most foods, candies, gums, dentifrices and medicines, and is used in many cathartics. It is the cause of many skin and mucous membrane lesions.

Drugs taken by mouth are especially productive of allergic dermatoses which may continue for a few weeks or even months after the drugs have been discontinued. *Barbiturates, bromides, iodides, arsenic compounds, quinine, phenolphthalein, acetanilide or antipyrin and especially sulfathiazole* may be causative factors. *Acetylsalicylic acid (aspirin)* may produce urticaria and angioneurotic edema, severe and even fatal asthma, or gastro-intestinal symptoms in sensitized patients. The doctor, therefore, must obtain a drug history from the patient, as discussed on page 22.

Iodine allergy (see page 103) produces nasal congestion, headache and swelling of the submaxillary and sublingual glands. Fever may result, and acne-like pimples often arise after a week or two of iodine or iodide therapy. Extensive dermatitis may occur in markedly sensitive patients even from iodine applied to a small cut.

Agranulocytosis which is characterized by disappearance of the granular white cells in the blood and by necroses in the gums, and often leads to death, probably is due to allergy in the blood-forming bone-marrow cells. This condition most frequently is caused by amidopyrine, but other drugs such as arsphenamine, some of the sulfonamide group, gold salts, and dinitrophenol, also may be responsible (see page 120).

Mineral and organic substances in drinking water may produce allergic manifestations in the gastro-intestinal tract, the skin, or other body tissues. *Chlorine* in water may produce dermatitis. Pollen in water probably causes cutaneous and at times gastro-intestinal symptoms in certain sensitized patients. Products of vegetable growths, or of animal life in the water, in the soil or on walls of reservoirs, tanks, pipes, or viaducts which hold drinking water may cause sensitization in rare individuals.

CONTACTANTS

Contact dermatitis or eczema is due to sensitization in the superficial epidermal cells of the skin and may arise to any substance which contacts the skin, even to infinitesimal amounts of the volatile resin from poison

ivy and other vegetation which may be in the air. This type of allergy is acquired; inheritance exerts no ascertainable rôle in it. Whether the active allergenic substance has to combine with a protein of the skin to which allergy then develops or whether the active allergen itself creates the epidermal sensitization is not known. The skin reacting bodies of atopic allergy and those responsible for the Prausnitz-Kustner reaction are not demonstrable in contact dermatitis. Experimentally produced sensitization in the skin of a monkey to a chemical substance seems to spread from the original site over the entire body. If the original site is on the foreleg and a cuff of the skin is cut out above it, the rest of the skin does not become sensitized Furthermore sensitization to contact allergens seems to vary in degree in different areas of the skin. Contact eczema often is called *dermatitis venenata*.

Contact dermatitis may develop in ten to twenty days after a single slight or brief repeated exposure to the allergenic substance. This, apparently is true of poison ivy and poison oak, since most people who live in an area where they grow become allergic to them. The inherent propensity to contact dermatitis, the thickness and character of the epidermis, and the nature of the contactant itself determine the development of contact allergy. Thus, dyes which fix themselves in the epidermis, oils of plants, such as poison oak, which are absorbed into the skin, and substances which neutralize the normal alkalinity of the skin surface and readily ionizable metallic salts are prone to produce contact allergy.

At times contact allergy develops only after prolonged and marked contact with the substance and especially if thereafter the person has no contact with the substance for a period of three or more weeks. Therefore, for people who work with substances apt to cause contact allergy, such as rubber, lacquers, or other chemicals, complete freedom from contact with th [illegible]

[illegible]

skin by a strip of adhesive tape for approximately forty-eight hours. The degree of reaction varies from a slight erythema to marked vesiculation and oozing. When severe allergy is present, the burning and itching may develop in one or two hours, so that it becomes necessary to remove the testing material If mild allergy is present, the roughness, redness, and scaling of the skin may not develop for two to five days. Therefore the test areas should be observed for several days after the initial forty-eight hours. Test substances which are volatile, such as the ether or acetone extracts of the resins of leaves of plants, may be applied to a small skin area without subsequent covering with adhesive, as advised by Shelmire. When marked allergy is present, the resultant reaction may spread over a wide area

Reactions to the substance may vary in different areas. Often they are most marked near the area in which eczema is present. Positive reactions may occur only in the presence of heat, friction, or other influences similar to those, which were present when the dermatitis developed

A positive test usually indicates that dermatitis would develop upon proper contact with the reacting substances. The rôle of these substances in the production of the dermatitis can be determined only by analysis of the history, results from eliminating these allergens from possible skin contact and the effect of hyposensitization, especially with plant oils.

Differentiation is necessary between substances which are skin irritants and those which produce allergy. Those which produce a reaction in every skin, such as certain acids, alkalis, and turpentine, are irritants. Certain substances in strong concentrations are irritants but may also produce allergy. Therefore a dilution which fails to react on the normal skin should be used for patch testing.

To list the tremendous number of substances to which contact allergy may arise is impossible in this manual. Tests must be made with those suspected by the patient or by the physician through a careful analysis of the history and the patient's various contacts at home, work or recreation. Each home, trade, profession, occupation, or recreation entails skin contact with materials such as chemicals, dyes, soaps, dentifrices, perfumes, cosmetics, plants, flowers, bulbs, fabrics, furnishings, clothing, lacquer, varnishes, paints, turpentine, woods, furniture polishes, waxes, oils, gasoline, glue, cement, rubber, vulcanizers, foods, spices, yeasts, metals, metal polishes, celluloid, bakelite, formalin, insecticides (including pyrethrum), antiseptics, anesthetics, drugs, and medicaments. The variety of contacts possible in recreation are obvious in horsemen, boatsmen, golfers, hunters, painters, gardeners, woodworkers, photographers, musicians, and animal lovers; and in each industrial occupation, many specific organic and inorganic substances demand consideration. A standard list of contactants for patch testing has been suggested by Sulzberger (see page 231). If reactions occur which do not check with the patient's history, the indicated susceptibility to contact allergy requires further patch testing with all specific substances encountered by the patient according to the suggestions in this paragraph.

Cosmetics and toilet articles used by the patient, by his relatives, or his friends, are especially prone to cause contact eczema. Some of these follow: hair tonics, scalp lotions, hair, eyebrow, and eyelash dyes, eyebrow pencils, creams of all types, cleaning lotions, astringents, face, body, and dusting powders, rouges, lipsticks, nail paints, nail polishes, cuticle removers, nail and hair lacquers, perfumes, mascara, freckle removers, hair removers, eyelash curlers, combs, hair ornaments, sunburn lotions, nasal drops and sprays, eye drops, deodorants, contraceptives, douching powders, menstrual pads, mouth washes, dentures, dentifrices, dental floss, hair setting solutions, and substances such as egg or orris root in wet or dry shampoos. Any one of the many chemical or organic ingredients in any of the above preparations may produce contact allergy. Patch testing with such ingredients often reveals the offenders.

Clothing and wearing apparel may produce dermatitis. *Wool, silk,* [illegible] dyed, may be respon- [illegible] ies which contact the

skin should be laundered before they are worn, especially if susceptibility to contact allergy is suspected. Certain chemicals used to "finish" fabrics produce contact allergy.

Dyes of various types may cause dermatitis. Simon and Rackemann reported dermatitis from a blue dye which necessitated patch tests with a small amount of the fabric of every suit, hat, tie, sock, or other dyed material worn by the patient to determine its possible allergic reactivity. Dyes in shoes and various ingredients in shoe polishes may produce local or even generalized dermatitis

Allergy to rubber or various ingredients in rubber materials, as in girdles, garters, arm shields, stockings, or dentures, may occur. *Phosphorus* allergy is one possible cause for localized dermatitis from matches or boxes carried in the pocket. *Nickel dermatitis* may arise under spectacle rims, garter buckles, or wrist watches. Allergy to tortoise shell rims of glasses has been noted. Further possibilities of these types are obvious.

Oils and resins of plants are important allergenic substances Poison oak and ivy are the most common cause of contact dermatitis. Primrose and many other flowering plants, such as daffodils, narcissus, jonquils, sage, pyrethrum, chrysanthemum, pansy, bleeding heart, gaillardia, and verbena, have been reported as causes of contact dermatitis. Trees and weeds, such as acacia, elm, English ivy, helenium, cocklebur, sage brush, ragweed, camomile, and marsh elder have caused contact dermatitis. The resins and oils in the skins of fruits, of vegetables, of meats, and of other food products may cause dermatitis on the hands and other skin areas of housewives, cooks, food handlers, and plant cultivators.

Further comment concerning *drugs and medicaments* which cause contact allergy is of interest. Ephedrine in nose drops, belladonna in eye drops, hexylresorcinol in tooth paste or for local application, iodine or benzoin used on the skin, novocaine, nupercaine, or other anesthetics used on the skin or mucous membranes, quinine and chloral in hair lotions and tonics, mercury, arsenic, balsam of Peru, butysin picrate, and many other chemicals, drugs, and essential oils in lotions, salves, or ointments which are applied locally cause contact dermatitis of the skin, scalp, or mucous membranes. Egg or orris shampoos produce urticaria or der[illegible] occurs. Some skins are [illegible] the natural irritants in soaps. Patch tests with various soaps, therefore, must be interpreted with these facts in mind.

Contact dermatitis in industry and in the manifold occupations has received much study in the last thirty years and its many causes and ramifications have been discussed in a recent book by Schwartz and Tulipan. It is recognized that in certain workers this type of allergy is more prone to develop than in others since their skins are more susceptible to irritants than those of others Tests to discover susceptible workers are recommended so that a type of work can be chosen for them which is not associated with danger of contact sensitizations. An additional discussion of contact dermatitis will be found on page 111.

A positive test usually indicates that dermatitis would develop upon proper contact with the reacting substances. The rôle of these substances in the production of the dermatitis can be determined only by analysis of the history, results from eliminating these allergens from possible skin contact and the effect of hyposensitization, especially with plant oils.

Differentiation is necessary between substances which are skin irritants and those which produce allergy. Those which produce a reaction in every skin, such as certain acids, alkalis, and turpentine, are irritants. Certain substances in strong concentrations are irritants but may also produce allergy. Therefore a dilution which fails to react on the normal skin should be used for patch testing.

To list the tremendous number of substances to which contact allergy may arise is impossible in this manual. Tests must be made with those suspected by the patient or by the physician through a careful analysis of the history and the patient's various contacts at home, work or recreation. Each home, trade, profession, occupation, or recreation entails skin contact with materials such as chemicals, dyes, soaps, dentifrices, perfumes, cosmetics, plants, flowers, bulbs, fabrics, furnishings, clothing, lacquer, varnishes, paints, turpentine, woods, furniture polishes, waxes, oils, gasoline, glue, cement, rubber, vulcanizers, foods, spices, yeasts, metals, metal polishes, celluloid, bakelite, formalin, insecticides (including pyrethrum), antiseptics, anesthetics, drugs, and medicaments. The variety of contacts possible in recreation are obvious in horsemen, boatsmen, golfers, hunters, painters, gardeners, woodworkers, photographers, musicians, and animal lovers; and in each industrial occupation, many specific organic and inorganic substances demand consideration. A standard list of contactants for patch testing has been suggested by Sulzberger (see page 231). If reactions occur which do not check with the patient's history, the indicated susceptibility to contact allergy requires further patch testing with all specific substances encountered by the patient according to the suggestions in this paragraph.

Cosmetics and toilet articles used by the patient, by his relatives, or his friends, are especially prone to cause contact eczema. Some of these follow: hair tonics, scalp lotions, hair, eyebrow, and eyelash dyes, eyebrow pencils, creams of all types, cleaning lotions, astringents, face, body, and dusting powders, rouges, lipsticks, nail paints, nail polishes, cuticle removers, nail and hair lacquers, perfumes, mascara, freckle removers, hair removers, eyelash curlers, combs, hair ornaments, sunburn lotions, nasal drops and sprays, eye drops, deodorants, contraceptives, douching powders, menstrual pads, mouth washes, dentures, dentifrices, dental floss, hair setting solutions, and substances such as egg or orris root in wet or dry shampoos. Any one of the many chemical or organic ingredients in any of the above preparations may produce contact allergy. Patch testing with such ingredients often reveals the offenders.

Clothing and wearing apparel may produce dermatitis. Wool, silk, mohair, cotton, rayon, linen, or furs, either plain or dyed, may be responsible. Dyed stockings, underwear, or night clothes which contact the

degree of allergy which may produce severe allergic shock with asthma, urticaria and other allergic symptoms when the infected tissues are incised and the allergen is released into the blood stream. Delayed intradermal reactions with antigens of these various parasites are of specific diagnostic value.

Allergy to the products of diseased or injured tissues may occur. A severe reaction in the eye may arise after a second cataract operation, due to the sensitization to the lens protein which was absorbed during the previous cataract operation (see page 128). In the same way it is possible for allergy to develop to the products of diseased or infected tissues in the body; unquestioned proof of this contention is not easy to obtain.

INSECT BITES

The papules, swellings, erythema, and itching which result from the bites of mosquitoes, fleas, bedbugs, lice, ticks, flies, bees, and similar insects are the results of allergy established by previous bites by the same type of insect. At times, hives in distant skin areas, asthma, hay fever, and even gastrointestinal symptoms may arise when the allergy is exaggerated. Severe urticaria, nausea, asthma, falling blood-pressure, shock and even death have resulted from allergy to bee and wasp venom

Hyposensitization with extracts of the insect in question reduces susceptibility to the bite. Successful hyposensitization with bee and mosquito antigens has been reported especially by Benson in 1936. It has also been carried out with antigens of lake flies and fleas.

INJECTANTS

Allergy may result from injected sera, drugs, vaccines, vitamins, hormones, and other ingredients in the products of ductless glands and their chemical synthetic forms, as shown in the outline on page 128. The allergens given to patients wh...
like, also can ...
in doses larg ... patient's tolerance. These various injectants usually are administered subcutaneously or intradermally. Sera, drugs, vaccines, vitamins, or allergens are often given intravenously; drugs and foods are given by rectum, and drugs, sera, and, at times, allergens for diagnostic or therapeutic purposes are introduced into the nasal, sinal, or aural cavities, or into the urogenital, vaginal, bronchial or cerebrospinal spaces. The possibility of localized, distant, or generalized allergic reactions from any one of these substances must be kept in mind. This type of allergy is more likely to occur in patients who have a definite allergic tendency, particularly to the development of drug allergies.

Allergy occurs to serum proteins which ...

... proteins that the injection of an extremely small dose produces an allergic reaction which ...

INFECTANT AND DISEASED TISSUE SENSITIZATION

Koch in 1882, in his epochal studies on tuberculosis, described a red papular reaction which appeared in twenty-four to forty-eight hours after the injection of tuberculin into the skin of a previously infected individual. *For this delayed type of reaction indicative of specific altered tissue reactivity, Von Pirquet coined the word "allergy."* Delayed reactions also develop from intradermal tests with antigens of smallpox, diphtheria, typhoid, pneumonia, and other infections. They indicate the presence of allergy to the products of the causative bacteria or viruses. These reactions arise to antigens of various yeasts and fungi pathogenic to man, and to echinococcus, trichinella, ascaris, and other parasites. Their importance in diagnosis is obvious.

The immediate wheal type of skin reaction described on page 24, usually is present in pollen or food allergy, but *rarely occurs in bacterial allergy.* Its absence in the latter may be due to continued infection. Of interest is the probability that this delayed tissue reaction produces more tissue destruction than the immediate wheal type of reaction. The delayed and continued allergic reactions to infectant products probably lead to many of the tissue changes which are caused by infection. The protective nature of allergy that arises from infectant allergens, however, is of great importance. As allergy and immunity develop, acute infections, such as measles, chicken-pox, and scarlet fever, gradually are overcome. Without tuberculin allergy the disease might spread without the walling off of inspired or harbored tubercular bacilli, and arrest of the infection might be impossible.

As stated, *yeasts and fungi* which produce disease in the skin and, less often, in other body tissues give rise to allergy. In patients affected with epidermophytosis or athlete's foot, sensitization to the allergen of the causative fungus may result in an eruption on the hands or on other skin areas. These lesions are called epidermophytids. They arise from blood-borne allergens or spores from the feet or other actively infected tissue. Other "id" eruptions to fungus and bacterial allergens probably are caused by foci of infection in a tissue distant from the skin lesions.

Bacterial allergy may arise to the streptococci, staphylococci, or other bacteria in foci of infection in teeth, tonsils, sinuses, prostate, gall-bladder, appendix, and pelvic, rectal, or other tissue. It probably affects every cell of the body, and if it is exaggerated in any special area, symptoms such as asthma, hay fever, arthritis or urticaria may develop. Bacterial allergy as a major cause of these manifestations, especially of bronchial asthma and hay fever, is much less frequent than was assumed fifteen or twenty years ago. The probable rôle of bacterial allergy in the production of clinical symptoms will be discussed in Chapter IV.

Allergy to parasites in the body tissues may produce tissue disturbances in the affected or in distant areas. Intestinal parasites, especially round worms, have been responsible for asthma. Allergy to other parasites likewise is possible. Echinococcus in the liver or lungs results in a high

Drugs for nervousness, sleep or anesthesia may be given hypodermic- [illegible]

If itching, skin rashes or other unusual symptoms develop while these or other drugs are being taken the drugs should be discontinued until the physician is consulted.

Allergy to iron or its compounds may occur. Gastro-intestinal symptoms are particularly frequent. Its injection or oral administration produces symptoms in sensitized patients.

Evidence is accumulating that *allergy may develop to the pure chemical vitamins* such as thiamin (vitamin B) and cevitamic acid (vitamin C) when they are given by mouth, subcutaneously, or intravenously. Milk-sensitive patients have various allergic manifestations when milk or its proteins are given intramuscularly for so-called non-specific protein therapy, or when it is given with barium in enemas for colon x-ray studies. *Allergens of milk and other foods may be present in the blood of a donor and cause allergic symptoms in a patient specifically sensitive to such foods.* Thus donors usually are asked to fast for three to four hours before their blood is taken.

The probability that *allergy develops to catgut, silk or other sutures and ligatures used in surgery*, buried as they are in the body tissues, has led to the use of materials that are least likely to produce sensitization. Suture allergy may prevent wound healing and lead to inflammation. Recently a silk-sensitive patient had induration and inflammation in an inguinal operative wound, in which silk suture was used, and all tissue harboring any trace of silk had to be excised. A fine, rustless, steel thread has been utilized especially by Bunnell.

Ingredients in *douches, contraceptives, and vaginal medicaments* may produce allergy. One patient had asthma and nasal allergy from the rose perfume in a contraceptive.

ALLERGENS TRANSMITTED BY THE PLACENTA AND MOTHER'S MILK

Allergens of foods eaten by the mother may pass from the blood through the placenta into the blood of the fetus and produce sensitization. Sensitiza- tion of the fetus to drugs [illegible]
difficult to prove [illegible]
though allergic derm[illegible] present at birth The intra-uterine sensitization probably accounts for the allergic symptoms which sometimes arise to the first ingested foods.

Mother's milk contains infinitesimal amounts of food allergens from the mother's diet, which are sufficient to produce allergic symptoms in markedly sensitive infants After the exclusion of these foods from the mother's diet, the baby's allergy may disappear

fatal. Many others are sensitive to a lesser degree, especially if serum has been given previously. Within a few minutes, or hours, or in a few days after its administration allergic symptoms of so-called serum sickness develop which are characterized by redness, swelling, and hives of the skin, wheezing or asthma, congestion and suffusion of the conjunctivæ and nasal membranes, fever, joint pains and swellings, headache, and other less common symptoms. Symptoms that occur in from a few hours to six or seven days usually are due to previous sensitization from former serum therapy and at times from allergy to the inhaled emanations or ingested meat of the horse or other animal whose serum is being given (see page 65). Serum sickness, that develops in from seven to twenty days, is due in nearly every case to the interaction of the serum proteins still present in the blood and tissues with the reacting bodies of allergy developed to the recently injected serum proteins. Any severe symptoms require the hypodermic administration of epinephrine 1 to 1000 (see page 220), and other therapy advised by the physician. The oral administration of histaminase, a ferment which breaks down histamine *in vitro*, has been advised for the prevention and relief of serum sickness. Its value, however, has not been established.

Before serum is administered, *the physician must make preliminary tests to determine any possible serum allergy.* Such tests and serum administration are discussed on page 218.

Other drugs, vaccines, hormones, and vitamins must also be given with the possibility of allergy in mind, especially when the patient gives a history of idiosyncrasy or intolerance to medicines or drugs taken in former years. It is often wise to give a small initial dose before the regular doses are taken in order to ascertain any possible allergy that may exist.

Iodine allergy is quite common. Therefore before iodized oil is injected intrabronchially or into any other cavity of the body or before an iodine-containing drug is given by vein, any possible allergy should be determined by giving iodides or the drug in question by mouth for a day or two. Patients must be informed about possible allergy to iodides as discussed on page 103.

Arsenic-containing drugs, such as the arsphenamines and cacodylates, are given subcutaneously, intravenously and orally. Allergy to these drugs may develop at any time during the patient's treatment so that if further arsenical drugs are given by mouth or by injection in the slightest amount, skin rashes, associated with itching and even severe generalized scaling dermatitis may develop which are persistent and at times endanger life. Arsenic allergy continues until all of the drug has been thrown off by the body. This may require weeks or months after the drug has been discontinued. Moreover, the slightest amount continues to enter the body (as from the eating of arsenic-sprayed fruit or vegetables, from mineral waters or impure medicines, from the inhalation of dust of houses in which traces of arsenic from wall paper or fumigated carpets or fabrics are present), then the dermatitis will persist.

interaction of atopen with antibody. Substances that arise in the tissues of patients who are afflicted with severe neuroses even might be responsible for the release of histamine.

SECONDARY FACTORS

It has long been recognized that bronchial asthma in particular and also hay fever or nasal allergy, allergic headache, and various dermatoses, especially atopic dermatitis, are exaggerated by *so-called non-specific causes*. *Dusts of all types*, especially in inhalant-sensitive patients, may exaggerate symptoms even when specific allergy to them does not exist. *Soap powders* are irritant even to normal people. *Odors, smokes, and chemical fumes*, especially of sulphur, formaldehyde, and paint produce secondary effects. *Changes in temperature, weather, humidity, and wind* may precipitate symptoms The effect of seasons and of proximity to the ocean, especially on food allergy, was discussed on page 56. The allergic balance may be upset by various *acute and chronic infections*, especially by head or bronchial colds. However, the frequent mistake of attributing the nasal manifestations of perennial hay fever or those nasal symptoms which often precede an asthmatic attack to an infectious cold must not be made (see page 99) The onset of bronchial asthma, urticaria, migraine, or sick headache *during menstruation* apparently is due to the heightening of the tissue reactivity before or during the period The failure of glandular therapy to relieve these manifestations confirms this opinion. The disappearance of various symptoms of allergy during *pregnancy* is explained by the state of anergy (inability to react to allergenic causes) which develops in many pregnant women. *Indigestion, overeating, and constipation* may lower the threshold of reaction so that allergic symptoms are increased or arise. Finally, *neurosis, nervousness, and excitement* secondarily activate potential or active allergies in many patients.

The *symptoms may be wrongly attributed to these secondary, non-specific causes*, largely because the physician cannot discover the allergens which are responsible. Often *neuroses* are blamed for gastro-intestinal, nasal, bronchial, cutaneous, and other tissue allergies, the persistence and chronicity of which are really responsible for, or increase potential nervousness and disturbed psychic states. In such cases, continued study and treatment of the patient from the allergic viewpoint obviously are important

PHYSICAL ALLERGY

Various symptoms of allergy may develop in certain individuals when they are exposed to cold, heat, and sunlight. Duke especially has studied these reactions. These physical agents probably change the proteins of the body tissues and cause an abnormal release of histamine or a similar substance, or sensitization is established to the changed proteins. Urticaria or angioneurotic edema may arise from heat or cold, and dermatitis from sunlight. Certain nasal and bronchial symptoms, such as wheezing, nasal congestion and swelling, together with generalized symptoms, frequently arise from physical allergy. They may be associated with ingestant or inhalant sensitizations. Moreover, cold, heat, and other physical agents may release or activate an underlying food or inhalant allergy which otherwise would produce no symptoms. The physical factors, therefore, may be secondary in their action. They are discussed below. Swineford discussed the frequency of physical factors as secondary initiating or aggravating influences and their minor importance as causes of allergic symptoms (for other discussion see page 114).

INTRINSIC ALLERGY

Intrinsic allergy presumably is caused by bacterial allergens in foci or other sources of infection, from allergens which arise in infected or diseased tissues (see page 92), *or from the results of metabolic or endocrine diseases.* A few cases of bronchial asthma, urticaria, arthritis, and perhaps of other rare allergic manifestations can be controlled by the eradication of bacterial foci or by hyposensitization with bacterial antigens. Other possible causes of intrinsic allergy, however, cannot be proved by clinical results and therefore are merely hypothetical.

Those manifestations of allergy which do not respond to current diagnostic and therapeutic efforts are ascribed to possible intrinsic unknown causes. It has been stated that probably 20 per cent or more of all cases of bronchial asthma, a similar number of cases of vasomotor rhinitis and most of the cases of chronic urticaria belong in this intrinsic group. However, cases of intrinsic bronchial asthma and perennial nasal allergy, are encountered less frequently in the writer's practice Furthermore, the minority of his cases of chronic urticaria are intrinsic Differences in climate and in the frequency of respiratory infection in the San Francisco Bay may be responsible in part. A more important explanation in the writer's opinion resides in the frequent and accurate use of elimination diets for the study of possible food allergy along with the treatment of inhalant allergy when it is present, as described in this volume. *The consensus is that this intrinsic group will decrease further as more adequate and efficient methods for the diagnosis and treatment of allergies are evolved.*

As an explanation of the origin of symptoms of intrinsic allergy, Alexander suggested that histamine (H-substance) may be liberated by intrinsic unknown causes in the cells of the shock tissues without the

Bronchial asthma due to food allergy tends to recur throughout the year, ... from the early fall to late spring, being most severe in January

...months and especially

...remembered.

for one or two days before it involves the pulmonary tissues. These attacks may recur every few days or weeks according to the degree of food allergy which exists. They may last for one to five or more days, and at times are associated with allergic fever or with secondary pulmonary infection, nausea, vomiting, and prostration. A refractory period then may set in and may last for a few days or weeks Since the "reacting bodies" in the pulmonary tissues have been exhausted during the explosive asthmatic attacks, the causative foods can be eaten for days or weeks without asthma until the "reacting bodies" again accumulate sufficiently so that their union with the food allergens produces the nasal and later the bronchial manifestations. As such recurrent attacks continue they may become less severe, more persistent and finally result in a chronic type of bronchial asthma which may be exaggerated at intervals. *In older patients, food allergy may be responsible for perennial asthma of many years' duration.* A low-grade infectious bronchitis may be superimposed. When large amounts of purulent sputum are expectorated, the physician should study the possibility of the presence of complicating bronchiectasis with iodized oil instillations and x-ray. Precautions in the use of iodized oil are noted on page 103. As previously emphasized, *food allergy often is complicated with inhalant allergy of varying types and occasionally with severe or mild bacterial allergy.*

Ingestant allergy due to various drugs may cause bronchial asthma. Aspirin or acetylsalicylic acid seems to exaggerate or produce such symptoms in about 20 per cent of all patients. Other ingested drugs rarely cause bronchial allergy.

Inhalant allergy also is an important cause of bronchial asthma. Often it is associated with food allergy. When *pollen allergy* is operative, the symptoms occur in the spring, summer, or fall according to the causative pollens ...

... a history of animal contacts is obtained and when positive skin reactions are present. The many sources of animal emanations in pillows, mattresses, furniture, carpets, pads under carpets and rugs, on friends' and relatives' clothing, and from other sources are discussed in Chapter III. *Dusts*, encountered in working, recreational and, especially, in home environments, are

CHAPTER IV

CLINICAL ALLERGY AND ITS CONTROL

In a book of this size the discussion of the manifestations of allergy and their therapeutic control must be limited. The types of allergy that usually are responsible for symptoms, the indications for the use of elimination diets, and the procedures necessary for the control of inhalant, bacterial, and contact allergy will be outlined. Other types of therapy which are useful in the alleviation of the various symptoms will be mentioned. For a more complete discussion of the writer's experience in the diagnosis and treatment of all these manifestations with a review of the literature, the reader is referred to the textbook entitled "Clinical Allergy" (1937). Other textbooks by Vaughan, Tuft, Rackemann, Coca, Walzer and Thommen, Feinberg, Balyeat and Urbach contain valuable theoretical and practical information.

Before the various clinical manifestations of allergy are discussed the *great importance of a complete physical examination, and laboratory and x-ray studies must be stressed*, so that all pathological conditions are discovered and all possible causes, including allergy, of the symptom-complex are considered.

BRONCHIAL ASTHMA AND ALLERGIC BRONCHITIS

When diagnosis of bronchial asthma is made the physician must realize that *not all dyspnea, wheezing, and coughing are due to this disease.* Obstructions, growths, and inflammations in the throat, larynx, and bronchi, foreign bodies in the bronchial tract, goiters, tumors around the trachea or in the mediastinum, decompensation of the heart, aneurysms, pneumonia, pulmonary tuberculosis and other pulmonary inflammations, pulmonary tumors, atelectasis, fluid in the chest, the alkalosis resulting from hyperventilation due to nervousness, and neuroses may yield symptoms which have been mistaken for bronchial asthma. On the other hand, patients with bronchial asthma have been treated for pneumonia, heart disease, emphysema, and other conditions. These considerations, of course, emphasize the necessity of an accurate diagnosis of bronchial asthma by means of a skillfully taken history, careful physical examination, and necessary x-ray and laboratory studies as discussed in Chapter II.

Recurrent or chronic bronchitis often is caused by the same factors that are responsible for bronchial asthma. Wheezing and difficult breathing are absent, due to a minimum of mucosal swelling, of mucus, and of smooth muscle spasm in the bronchi. All infectant causes of bronchitis especially those due to tuberculosis, must be ruled out by physical examination and x-ray and laboratory tests.

relief occurs, the tolerance for the allergenic foods can be determined, as discussed on page 139. The necessity of great accuracy in dieting and the methods suggested for its accomplishment are explained on page 137. With all diet trial proper nutrition and weight maintenance is assured if the elimination diets and their menus are used as detailed in Chapter V.

When chronic bronchial asthma is present, inhalant allergy as well as food allergy should be suspected. The rôle of one or both of these types of allergy can be determined with the coöperation of the patient. As discussed on page 137, skin reactions to allergenic inhalants may be negative or indefinite, but this occurs less often than to allergenic foods. If *inhalant allergy* is [illegible] in the patient's be[illegible] important. If the [illegible] control has not produced relief, the strict control as discussed on page 31 should be established. This control is especially necessary in cases of intractable asthma and may best be accomplished in a hospital room. With proper control, and an accurately prepared elimination diet, as well as with the hyposensitization therapy discussed in the following paragraph, and the medical procedures suggested in this chapter, only a few patients with severe or intractable bronchial asthma do not respond favorably. *Many patients in whom the diagnosis of intractable or intrinsic asthma was formerly made have been markedly or nearly entirely relieved when this attitude toward food and inhalant allergies was taken,* and the prescribed treatment of the symptoms was continued over a period of one to three months.

When *pollen allergy* is evident from history, skin testing or the results of environmental control, hyposensitization with proper antigens as discussed in Chapter III is necessary; usually it must be continued for one or more years. However, relief may occur in a week or so with co-seasonal therapy (see page 39). When *animal emanation and miscellaneous inhalant allergies* are indicated by history, skin testing, or the results of environmental control, hyposensitization with proper antigens also is usually necessary. If the sources of the inhalants can be eliminated from the patient's environment, hyposensitization may not be required. As noted on page 43, the antigens must contain active allergens of the specific allergenic substances which affect the patient. Doses must be given and increased conservatively and symptoms must never be reproduced or exaggerated by injections. *House dust allergy* necessitates proper environmental control. Hyposensitization is beneficial in most of these patients but should be done with properly prepared autogenous dust extracts (see page 46). The same applies [illegible] ists to other [illegible] dusts [illegible] grain

The [illegible] *of the symptoms of bronchial asthma* requires brief comment in this handbook. *The hypodermic administration of 1 to 1000 epinephrine solution* in from 0.1 to 0.8 cc. according to the age of the patient and the severity of the asthma is of greatest valu[illegible]

common causes of inhalant bronchial asthma. Skin reactions frequently are positive, and are of clinical significance, especially when extracts of the dusts encountered by the patient are used. Furthermore bronchial asthma often arises to the so-called *miscellaneous inhalants,* including kapok and cottonseed allergens, especially from old mattresses, pillows, and furniture, from orris root, karaya gum, pyrethrum, silk, flaxseed, and glue dust. All of these may be inhaled as such or may be in house or in other types of dusts. These inhalants have been discussed individually in Chapter III.

Bacterial allergy as a cause of bronchial asthma or of allergic bronchitis is rare but, as noted on page 92, when it is present, its recognition and control are mandatory. Harkavy, in 1941, reported bronchial asthma associated with bronchitis, pleurisy, pericarditis and other cardiac disease and in a few instances with periarteritis nodosa in which bacterial allergy was an important cause.

Finally, *neurogenic asthma* should be kept in mind. It also may arise in patients who are affected by ingestant or inhalant asthma, particularly nervously unstable and anxious individuals.

So-called *intrinsic asthma* due to unknown causes has been discussed on page 96. This group will steadily decrease as the information concerning causes and proper treatment of bronchial asthma increases. Accurate use of the elimination diet, especially, has relieved many patients in whom the diagnosis of intrinsic asthma was made previously.

The diagnosis of the various ingestant and inhalant causes of bronchial allergy has been discussed in Chapter III. It was noted therein that, when food allergy is suspected, *trial diet usually should be used for several weeks for diagnostic study.* For this purpose the Cereal-free Elimination Diets 1, 2 and 3, menus for which are given on page 156 for adults, and on page 179 for children, have been of most value. The occasional patient in whom test negative diets can be used is discussed on page 14. *The failure to use elimination diets properly and over a sufficient period of time accounts, in the writer's opinion, for the inability to relieve a great number of patients in this country today with chronic bronchial asthma in whom food allergy is the sole cause or an important secondary cause of the symptoms.* When legume allergy is suspected, Diets 1 and 2 as given on page 159 may be used. Other elimination and supplemental diets may be necessary before the possibilities of food allergy can finally be determined.

The time necessary for adequate diet trial, as noted on page 135, must be appreciated. When food allergy has been active for many years or even only for a few months, the resultant tissue changes in the bronchial and other pulmonary cells persist for days and often for weeks after allergenic foods have been eliminated from the diet. The speed of recovery will be increased if every trace of the allergenic foods is eliminated. The final determination of specific food allergies by gradual additions of individual foods to the diet when the patient has been symptom-free for a period longer than was usual before diet trial, can be made according to the suggestions on the use of diet trial on pages 135 and 143. *After*

but may produce more prolonged shrinkage of the nasal mucosa with less general reaction when they are applied intranasally. *Privine*, recently introduced, is preferred by some patients.

The *iodides* have long been used for the control of bronchial asthma. Some patients are relieved entirely by such medication. The relief obtained from many proprietary medicines may be due to the iodides. The saturated solution of potassium or sodium iodide in from 5 to 20 drop doses in water three or four times a day, according to the age of the patient, should be prescribed until relief occurs. Or potassium or sodium iodide itself may be given in capsules or in simple elixir in doses of 0.2 to 1 gram. Thereafter a gradual reduction of dosage is indicated according to the symptoms. All patients should be told about idiosyncrasies to iodides. If nasal congestion or headache develops, or if swelling of the submaxillary glands, a rash or pimples occur, the iodide should be discontinued. If asthma recurs, it may be resumed in doses which can be tolerated without undue discomfort. *The oral administration of iodides to determine any possible allergy thereto, before they are injected intravenously or instilled intrabronchially, should be a routine procedure.*

When iodide allergy exists, *ammonium chloride* in doses of from ½ to 1 gram three to six times a day may aid expectoration. Its irritant effect on the ...

... ingredients of the coating, or allergy to the dye may occur. Expectoration also is enhanced by *potassium citrate, syrup of ipecac and apomorphine.* Apomorphine should be taken in doses of $\frac{1}{10}$ grain for adults.

Furthermore, ammonium chloride with a low sodium chloride intake *increases* the acidity of the blood and tissues and counteracts dyspnea, a tendency to hyperventilation and nervousness which are accompanied with and result from the relative alkalosis. Such therapy may reduce or relieve dyspnea which has been attributed to uncontrolled asthma, to complicating emphysema or possibly to myocardial weakness.

The *inhalation of smoke from the burning powder of stramonium leaves and saltpeter and at times belladonna and lobelia*, which are the main ingredients of such proprietary preparations ...

... *has not benefited the writer's patients with bronchial asthma.* *Aspirin or acetylsalicylic acid* in from 5 to 10 grain doses one to three times a day is of marked benefit in some cases of bronchial asthma. In about 25 per cent of the patients, however, aspirin increases asthma or produces allergic symptoms, as described ... Fatal asthma from ... sho ... however, dos ... Initial ... used to determine possible preexistent aspirin allergy. It may be more effective when it is combined

Small doses repeated every two to five minutes at times are better than large ones. Larger doses may be repeated every ten to thirty minutes until relief occurs. If no relief is obtained after two hours or so, the patient may be "epinephrine fast" and may require other forms of treatment. The slow administration of 0.2 to 0.8 cc. of epinephrine solution 1 to 1000 over a period of three to five minutes may be helpful. *In rare instances a patient may be allergic to epinephrine* and an "Arthus-like" necrosis or ulcer may develop at the site of injection. Occasionally, the epinephrine may enter the circulation because the needle has pierced a small arteriole. Palpitation, dizziness, severe trembling, and weakness may result but they rarely if ever are serious. If relief occurs from epinephrine, it may be administered every one to six hours if necessary for weeks, months, or even years without ascertainable injury. However, if the symptoms are continuous further study of the causative allergies should be made. Their gradual control may eradicate all or most of the asthmatic symptoms.

Epinephrine in a 1 to 100 or 1 to 50 solution, vaporized with a proper atomizer and inhaled deep into the bronchial tract, will control most mild recurrent bronchial asthma. The number of deep inhalations required to give relief depends on the density of the vapor and on the degree of asthma. The inhalation may be repeated every few minutes until relief occurs. The continuous inhalation of this vapor under oxygen or air pressure until 1 to 2 cc. have been inhaled, as advised by Barach and Graeser, has given marked relief in some intractable cases. *Care must be taken not to swallow any drops of this strong epinephrine solution since gastro-intestinal distress and cramping may result.* Therefore, after any prolonged or repeated inhalations rinsing the mouth is recommended.

Epinephrine which has been suspended in oil and is injected intramuscularly, as described by Keeney, produces a prolonged effect in many cases. Since allergy to peanuts is not uncommon, the writer has advised the use of sesame oil, allergy to which is extremely rare. Sensitization to allergens in corn and in cottonseed oil also must be remembered. Spain recently used epinephrine in gelatin for intramuscular injection, which obviates possible allergic reactions to the oil allergens.

Ephedrine sulphate in 3/8 or 3/4 grain capsules, taken by mouth, relieves mild asthmatic symptoms. Since it often produces nervousness, insomnia and palpitation, and, if it is taken repeatedly, may produce spasm of the bladder sphincter and urinary retention in men, its use may be contra-indicated. When it is combined with a barbital and with aminophyllin, the nervousness may be eliminated and the action of the ephedrine may be increased. Recently enteric coated capsules have been used, so that the action of the ephedrine is delayed three to six hours. These are useful in cases of nocturnal asthma. Ephedrine given hypodermically or by inhalation, is not as effective as epinephrine. Clinical allergy to this drug may arise in the lips and the nasal and pharyngeal mucosa.

Synthetic drugs similar to ephedrine, such as *ephetonine, neosynephrine* [illegible] are less effective than ephedrine when they are ingested,

the symptoms are greatly diminished or have entirely subsided. Sometimes, oxygen, aminophyllin and intravenous glucose therapy must be continued for one or two weeks along with the other advocated measures before relief will permit less energetic treatment. As emphasized in this and in other chapters, *maximum results from elimination diets depend on absolute strictness perhaps for several months. Inhalant allergens also may persist in the bronchial and nasal passages and probably in the blood and body tissues for many days,* or for longer periods, and may require continuous environmental control for days or even weeks before the allergens [illegible]

After relief is definite, the gradual determination of the allergenic foods and a decision as to the necessity of continued environmental control and hyposensitization therapy can be made, as already discussed in this section *Coöperation of the patient over a long period of time,* as emphasized on page 39, is an important factor whenever bronchial asthma is present

Bronchoscopy should be done whenever bronchial obstruction from mucus, growths or foreign bodies is suspected. Prickman recently reported benefit from bronchoscopy in bronchial stenosis due to chronic or intermittent localized inflammations. In intractable or persistent asthma, [illegible]

[illegible] is of special value. Fifteen to forty million bacteria should be injected by vein. This dose should be repeated in one hour if a chill and fever up to 101° F. have not developed. This fever therapy may be repeated every four to five days on three or four occasions. *Neo-arsphenamine* in some cases of chronic asthma is indicated if spirochetes are found in an abundant and especially foul sputum. Its non-specific effect possibly explains why Fowler's solution by mouth was formerly used with benefit in some cases of bronchial asthma. Finally, *psychotherapy* is an important adjunct especially in those patients in whom psychogenic asthma is suspected

Patients [illegible] the advocated [illegible] by *x-ray therap*[illegible]. However, it is rarely more than [illegible]iative, and the study of the causative allergies and therapy directed [illegible]ard their eradication or control must continue.

[illegible]hen severe or intractable bronchial asthma is associated with great [illegible]comfort and possibly cyanosis or *with evidences of cardiac failure or* [illegible]*ulatory collapse,* only foods selected from the elimination diets should [illegible] given They may have to be in a liquid or soft form. Environmental [illegible]trol must be established, as already noted. The benefit to be obtained [illegible]m epinephrine, ephedrine, and iodide therapy must be utilized. [illegible]oper treatment of the cardiac disease, of course, is necessary.

with ephedrine or with aminophyllin. Possible benefit to bronchial spasm from 5 to 8 grains of *caffein citrate* has been suggested by Bray.

Morphine, opiates, and large doses of barbitals should not be used for relief of bronchial asthma. The patient with asthma must be alert and must be able and willing to use his accessory respiratory muscles. Drowsiness or stupor in severe attacks may lead to improper oxygenation of the blood, to asphyxia, and to death. The writer has seen several deaths from morphine, one from codein and a barbital, and another from phenobarbital and sodium pentobarbital. This contraindication for opiates is justified. Since satisfactory procedures for the relief of symptoms are available, as herein described, the use of opiates in the treatment of bronchial asthma is unnecessary.

Small doses of barbitals for sedation only may be warranted. Paraldehyde, in doses of 15 cc. in 60 cc. of soy, sesame, or olive oil, given by rectum, may give definite relief by causing increased mucoid expectoration. The dose may be repeated in eight to twelve hours, if necessary. *Ether in oil, given by rectum,* may be used in selected patients. Maytum advised 15 cc. of ether in 15 cc. of olive, sesame, or soy oil for each 20 pounds of the patient's weight. As consciousness returns, 200 to 500 cc. of mucus may be expectorated and consequent marked relief may be obtained. The following therapy of severe asthma has displaced the necessity of ether and oil treatment except in rare instances.

If the patient fails to obtain relief, the physician may first ascertain the effect of aminophyllin. It may be administered in doses of 3½ to 7½ grains in solution according to age, by vein during a two- or three-minute period, and repeated if necessary one or two times during a twenty-four hour period. If fluids have not been taken and dehydration of the body tissues has taken place, *glucose solution may be given by vein* until adequate fluid can be taken by mouth. The glucose may be in salt solution if the blood chlorides have been depleted and the oral intake of sodium chloride has been inadequate. Excessive salt solution, however, may be dangerous. If the asthmatic symptoms fail to respond, *the continuous inhalation of 100 per cent oxygen* with a Boothby, Lovelace, Bulbulion (B.L.B.) mask, or if such a mask is not tolerated, *oxygen therapy in an oxygen tent* should be instituted In very severe cases, the oxygen tent should be used immediately instead of the B.L.B. mask. If relief does not result, the inhalation of a mixture of 20 per cent of oxygen and 80 per cent of helium, preferably with a B.L.B. mask or in a tent properly constructed for the use of helium gas is advisable. With the continued use of oxygen therapy and especially of the helium-oxygen inhalation over four to six hours, the severest attack of asthma may be ameliorated. The patient begins to expectorate mucus and is able to respond to epinephrine or aminophyllin therapy. The oxygen tent usually makes the helium-oxygen therapy unnecessary though oxygen may have to be continued for several days.

As relief occurs, the continuance of elimination diet, environmental control, iodide therapy, and epinephrine therapy are absolutely necessary until

or to so-called catarrh or a head cold. The recurrent exaggeration of allergy accounts for the frequent or occasional exaggeration of the symptoms which often are wrongly attributed to recurrent exacerbations of nasal or sinal infections However the absence of definite fever and of the usual malaise of true respiratory infections is characteristic.

Bacterial allergy is a very rare cause of nasal allergy. Vaccine therapy rarely is beneficial. The use of surgical therapy on the nose, both for nasal allergy and for bronchial asthma gradually is declining. Its indications are discussed later.

Intrinsic allergy (see page 96) due to unknown causes is responsible for a limited number of the cases of perennial or so-called vasomotor rhinitis In such cases elimination diets should be prescribed. Allergy to products of bacteria, or of diseased tissue or metabolic or endocrine disturbances —

t

The tendency to recurrent otitis media in childhood may be increased by uncontrolled nasal or aural allergy. Some cases of Ménière's disease are due to food and rarely to inhalant allergies.

X-ray studies of the sinuses, especially of the maxillary sinuses, may show opacities which are due either to a thickened mucosa and accumulated mucus caused by localized mucous membrane allergy, or to absence of aëration because of the closure of the ostia by allergic edema in the mucosa. *Formerly, the serious mistake was made of assuming infection in antra and sinuses* merely because opacities were demonstrated by *x*-ray or transillumination.

The microscopic examination of the nasal mucus and of that obtained from sinuses in which infection or allergy is suspected is an important diagnostic test, as proposed especially by Hansel The secretions are smeared on a glass slide, stained with Wright's or Giemsa's solution and examined to determine the presence of eosinophiles or pus cells. Clumps of eosinophiles indicate allergy; pus cells indicate infection. The presence of both types suggests allergy and infection. The absence of eosinophiles even on several occasions does not

When

therapy

cated wh symptoms is obtained even with negative skin reactions. Ocular tests (see page 25) may be positive. Perennial pollen therapy is advisable. Large doses gradually should be attained and repeated as tolerated until the pollen season begins. If symptoms are controlled during the season, a slightly reduced dose may be continued every five to seven days. If mild symptoms develop, small doses of the same or of weaker dilutions are indicated every three to seven days. If severe symptoms arise, co-seasonal therapy as described on page 39 is necessary or therapy may be stopped. Perennial hyposensitization should continue until the symptoms are practically or entirely absent for two or three years. The persistence of hyposensitization varies with the

SEASONAL AND PERENNIAL NASAL ALLERGY (HAY FEVER)

When allergy affects the mucosa of the nasal passages and of the sinuses, so-called hay fever results. *Pollen allergy produces seasonal symptoms* in the spring, summer, or fall according to the pollens to which the patient is sensitive. Here in California, where pollen continues in the air throughout the year, perennial nasal allergy from pollen may occur. Some patients are sensitive to almost all pollens so that symptoms begin with the first grass and tree pollination, and extend into the late fall when the frost sets in. Others have symptoms only when one type of pollen is in the air, notably ragweed pollen in the eastern, southern and mid-western states. Frequently the ocular tissues are affected, and bronchial asthma or bronchitis also may occur. Some patients have allergic dermatitis and, rarely, gastro-intestinal symptoms from pollen allergy. As in all clinical allergy, skin reactions may be negative, and the prevalent pollens in the air must be suspected In the Southern and Southwestern states and to a less extent in other areas, empirical treatment with all the prevalent pollens and fungi in a considerable group of patients with seasonal hay fever fails to give results. A so-called X or unknown factor is assumed.

Furthermore, *nasal allergy may arise from the various animal emanation and dust allergens, and from miscellaneous allergens, including orris root, karaya gum, pyrethrum, kapok, cottonseed, and spores of fungi,* as already described in the section on bronchial asthma, and in Chapter III. These inhalants are prone to cause perennial nasal allergy or at least symptoms in certain environments when specific allergens are inhaled.

Food sensitization is a common cause of nasal allergy. The symptoms are perennial unless a seasonal food is responsible. The symptoms from common foods usually are worse in the winter and better in the summer and away from the ocean, as is true of bronchial asthma. Nasal allergy due to food is more often associated with marked congestion, blocking and loss of smell than when it is due to inhalant allergy. Also polyp formation apparently is more common in food than in inhalant sensitive patients. Sneezing may be severe and paroxysmal. *Itching which is so frequent in inhalant allergy, may be nearly or completely absent* when food allergy is the cause.

Nasal allergy, due to inhalants, especially to pollens, is characterized by sneezing, watery or mucoid discharge from the nose, by watering, burning, and redness of the eyes, by varying degrees of nasal congestion and blocking which may be especially bad at night, and by itching of the nose, eyes, and, at times, of the throat, nasopharynx, palate, Eustachian tubes, and the skin of the face and neck. When inhalant allergy is suspected, a carefully taken history often casts suspicion on the causes, as discussed on page 20. Thus food sensitization and to a less extent animal emanation and dust sensitization are responsible for persistent nasal allergy which is erroneously assumed to be due to chronic sinusitis,

Ionization of the nasal mucosa is unwise because of resulting discomfort and only temporary if any relief. Cauterization with phenol, silver nitrate, or trichloracetic acid, as advised by rhinologists, may give relief but it usually is of brief duration. All these forms of therapy give only temporary help. The patient's discomfort is not satisfactorily relieved until the allergenic causes are discovered and controlled.

ATOPIC DERMATITIS (ECZEMA) AND CONTACT DERMATITIS (ECZEMA)

Atopic dermatitis or eczema is due to blood-borne allergens which are absorbed from ingested foods or drugs, j
the nasal or bronchial tracts, and fror
infections in various parts of the body.
reactions, a positive family history of allergy and the so-called Prausnitz-Kustner reacting bodies in the blood are usually present. Thus, most infantile eczema, and eczema in young children and in many adults are atopic, and arise from blood-borne allergens. Such dermatitis is the result of allergic reactions in the sensitized tissues of the capillaries in the lower layers of the skin. Because of increased vascular permeability, fluid exudes from areas of edema with resultant minute papules of vesicles. These gradually increase in size and become palpable through the epidermis. Itching usually is intense and scratching and rubbing of the skin may break open the multitudinous vesicopapules with resultant oozing of serous fluid. Crusting, thickening, lichenification and hyperkeratosis of the skin follow. Oozing may gradually cease but scaling, thickening and itching of the skin continues. Sometimes minute and diffuse papules instead of vesicles form, and scaling, thickening, and itching occur without associated oozing and crusting. Because of the scratching and rubbing of the skin, excoriations practically always are present in varying degrees.

Infantile eczema usually is atopic in type. It is due to blood-borne allergens, especially from ingested foods. Nursing infants may be allergic to food allergens in the mother's milk. When foods allergenic to the baby are eliminated from the mother's diet, the nursing infant's eczema may improve or disappear. Milk and eggs in particular and cereal grains, fish, and certain fruits are common causes.

As age increases, blood-borne allergens from various inhalants, such as feathers, wool, kapok, cottonseed, silk, animal emanations, miscellaneous ones including house and environmental dusts, and pollens, may cause eczema. Nevertheless, food allergy remains the major cause throughout infancy.

Atopic dermatitis in children after the first year and especially in older children and young adults arises not only from food allergy but increasingly

preseasonal treatment. As noted elsewhere in this book, the control of food allergy during the pollen season may be required for good results from pollen therapy or may even make pollen therapy unnecessary. Fungus allergy (see page 49) and other inhalant allergy also may be major or complicating causes of seasonal hay fever and require treatment.

If allergy is the probable cause of perennial nasal symptoms, then food, inhalant and infrequently bacterial allergies must be studied as advised in the foregoing discussion of bronchial asthma. *The elimination diets* should be used when food allergy is suspected. They should be prepared accurately and followed for a requisite period of time, as discussed in Chapter V. *Environmental control, the use of antigens which contain various inhalants indicated by history and skin testing*, and the use of properly prepared house dust and other types of dust antigens, as discussed in the section on bronchial asthma, are necessary when inhalant allergy is suspected. Since orris root may cause nasal allergy, allergen-free cosmetics and orris root hyposensitization may be required. Feather, pyrethrum, kapok, and cottonseed allergies are common causes. For a more complete consideration of the details of diagnosis and treatment of nasal allergy, the reader should consult the larger texts, such as that of the writer and those of others listed on page 250.

Surgery on the nose and sinuses for the relief of nasal allergy should only be done after an adequate allergic study has been made and proper anti-allergic treatment has been carried out. Polyps in the nose which obstruct breathing may need to be removed early. After the allergy has been brought under control, the correction of a definite nasal septum deviation may be advisable. As noted, antra and sinuses should never be operated upon merely because an opacity is demonstrated. If pus is shown by microscopic examination, and evidences of acute inflammation of the antra or other sinuses are present, then proper washing or surgery is justified. Often operations done on allergic antra or sinuses have led to secondary infections which have, in turn, necessitated further surgery. Such superimposed infections in sinuses which are still involved with unrecognized and uncontrolled allergy have led to so-called chronic sinusitis, varying degrees of invalidism, and often to other clinical complications

Temporary relief from symptoms of nasal allergy may be obtained from instilling or spraying into the nose a 1 per cent ephedrine in salt solution; 0.25 per cent neosynephrine in salt solution produces fewer constitutional reactions. Recently Privine has been of definite help in several patients with nasal allergy. The ingestion of ephedrine, ⅜ or ¾ grain, or the use of ephedrine combined with a barbital may give relief. At times, potassium [illegible] Epinephrine 1 to [illegible] ture of belladonna or of atropin in doses sufficient to produce dryness of the mouth or slight dilatation of the pupils gives symptomatic relief in some cases. Ammonium chloride in from ½ to 1 gram doses given three *to five times daily* together with a salt-poor diet also may reduce edema of the nasal mucosa.

active, environmental control may suffice or hyposensitization, as discussed in the section on Asthma, may be required. When pollen allergy is present, treatment often must be given with very dilute antigens, so that therapy does not increase or exaggerate the dermatitis. Co-seasonal daily therapy may be necessary for several weeks or months until definite improvement occurs (see page 39). Some of our best results have been obtained with frequent injections of an antigen which contains all important or moderately important pollens in the patient's environment in dilutions of 1 to 500,000, or even weaker, depending on the resulting exaggeration or improvement. At times atopic dermatitis due to pollen allergy is associated with positive patch tests with the resins of the same plant.

Pyogenic and at times fungus infections of the skin may complicate atopic dermatitis and may be mistaken for it. Allergic dermatitis or "id" eruptions arise from fungus and from bacterial infections in the skin and other body tissues (see page 92). The *naturally dry, ichthyotic skin* which scales and itches must always be recognized and should not be treated for assumed allergy. In infancy, *seborrhea of the skin*, particularly when the scalp is involved, must be properly treated with ammoniated mercury or sulphur salicylic acid ointment, as advised in [illegible]

[illegible] containing epinephrine. Such a mixture can be made by adding 4 cc. of 1 to 1000 epinephrine solution to 1 or 2 oz. of oil, shaking it well before applying to the skin. For acute vesiculopapular and oozing lesions [illegible] tion or especially of [illegible] benefit X-ray in [illegible] the lesions and especially the pruritus. Recognized dangers of excessive total dosage must be fully appreciated.

CONTACT DERMATITIS OR ECZEMA

This is caused by a sensitization of the superficial [illegible]

When contact dermatitis is severe, as from poison ivy, poison [illegible] and from many other plants [illegible] dermatitis venenata Tem[illegible] is best obtained with moi[illegible] [illegible] boric acid solution, Burow's solution diluted twenty to forty times with water, or with hot or cold salt solution or with water. A 2 or 3 per cent [illegible]

* When [illegible]

are worse in the fall, and winter and spring, environmental allergens and especially food allergy, as noted on page 56, must be considered.

Senile pruritus with varying dermatitis, especially on the legs, requires consideration of allergy as a cause. When it is seasonal, pollen allergy must be studied. Perennial pruritus frequently is due to food allergy and requires prolonged and proper use of elimination diets with maintenance of nutrition, as advised in Chapter V. Wheat and milk allergy are common causes of senile pruritus.

Skin reactions by the scratch method in infants and young children are more often positive than in adults. Reactions to egg are especially frequent. When the infant has never ingested egg, the sensitizations may have developed in the uterus or through the mother's milk. These positive reactions may or may not indicate clinical allergy. Hill has emphasized that allergy to cow's milk often causes eczema in infancy.

Skin testing in infants should be done by the scratch test with ingested foods and with encountered inhalant allergens. When generalized eczema prevents skin testing, passive transfer testing may be advisable (see page 25). *Older children* may be tested with a larger number of food, inhalant, dust, and pollen allergens by the scratch test. The inhalant allergens under suspicion which have failed to react by the scratch test (see page 24) may be tested intradermally. However, the injection of such allergens in relatively large doses may intensify the dermatitis when inhalant allergy is responsible. It may be better to assume inhalant sensitization than to risk exaggeration of the eczema with such intradermal tests. *Adults* should be thoroughly tested as has been suggested for the asthmatic patient. The fallibility of the skin test, as discussed in Chapter I, must be kept in mind

For the diagnosis of food allergy, the use of the elimination diets is necessary in practically every case. Many poor results in atopic dermatitis or eczema, especially in infants but also in adults, in the writer's opinion, are due to the dependence on test negative diets and the failure to use diet trial with elimination diets for a sufficient period of time. For infants a special cereal-free elimination diet is detailed on page 179. For children over one year of age another diet is available on page 180 For older children and for adults, the various elimination diets according to age and caloric requirements are detailed in Chapter V. The time necessary for diet trial, the necessity of absolute strictness and coöperation, and the other precautions stressed throughout this book must be remembered at all times if food allergy is to receive proper consideration. In infancy, especially, adequate protein intake must be assured and anemia and [illegible] Edema from nutritional damage for [illegible] ansfusions were required has been [illegible] it, the foods may have to be excluded for several months or even years before tolerance is established. Maintenance of nutrition as discussed on page 140, is of course, imperative.

For the study of *inhalant allergy*, environmental control, as discussed in the section on Bronchial Asthma, in addition to an adequate history and indicated skin testing may be necessary. *When inhalant allergy is*

.cquers, and with the many other substances discussed on page 88, has ot been successful. At present, the removal of the patient from all ossibilities of contact with such causative allergenic substances must be epended upon for relief.

URTICARIA AND ANGIONEUROTIC EDEMA

Urticaria or hives are due to localized allergy in the capillaries and small arterioles in the skin. Angioneurotic edema or acute circumscribed edema arises from allergy in the larger blood-vessels of the skin and subcutaneous tissues The lymphatics may also be affected. Increased permeability of these vascular tissues allows exudation of fluid and consequent edema The resultant hives or swellings depend on the degree and extent of the allergic reaction. The evanescent and wandering nature of the affections is due to increased allergy in certain vascular areas with consequent desensitization or refractoriness resulting in inability of those particular areas to react for varying periods of time.

Urticaria has been observed in the mucous membranes of the mouth, pharynx, esophagus, and bronchial tract and it probably also occurs in the mucosa of the gastro-intestinal tract.

Angioneurotic edema usually involves the skin and subcutaneous tissues of the face, lips, neck, hands, and feet, and less frequently of any other area It often affects the tongue and throat. When laryngeal edema occurs, suffocation and even asphyxial death may result. The swellings may occur in the *gastro-intestinal tract* or in other abdominal organs. They produce pain, acute digestive symptoms, and occasionally cause temporary intestinal obstruction, so-called phantom tumors, and swellings with cramping, and varying distress in localized areas of the colon, sigmoid, or rectum Angioneurotic edema may also occur in the *brain or spinal cord* and their membranes, and cause symptoms of brain or cord tumors, it may be found in the *urogenital tract* or in the *lungs* where it produces evidences of transient pneumonia. When the swelling occurs in the joint tissues, so-called *intermittent hydrarthrosis* may follow. However, the skin and subcutaneous tissues, are the areas of predilection.

These allergic manifestations most frequently arise from food allergy. Fruits and fish are common causes of urticaria but less frequently of angioneurotic edema. Those foods which are excluded from the elimination diets also must always be suspected. Furthermore, any food or condiment, including those in the elimination diets, may cause these allergic manifestations. *Drugs* of many types must always be considered.

Bacterial allergy is an important cause of chronic urticaria and angioneurotic edema. It is established by foci of infection, especially in the teeth, gums, tonsils, prostate, and anal fistulæ, and less commonly in the sinuses, gall-bladder, appendix. Even the bacterial flora in the membranes of the nasopharyngeal or bronchial tissues and in the gastro-intestinal tract and diverticulæ may produce allergy. Infectant allergy causing these lesions may also arise from epidermophytosis or other fungus

or a 1 to 5000 potassium permanganate solution may relieve itching and prevent spreading. As the dermatitis becomes drier, calamine lotion with 0.5 per cent phenol or with liquor carbonis detergens, and later with various tar, salicylic acid and ichthyol ointments, as recommended by dermatologists, may be helpful. When the dermatitis is due to an oil or resin from some prevalent plant or weed, such as ragweed, cocklebur, helenium, or mugwort, the patient may have to leave the area where such vegetation grows until the dermatitis improves. Contact allergy from various substances encountered in the home, in working or recreational environments, especially in the industries, necessitates the prevention of all possibilities of contact with the allergenic substance. Sometimes a change of occupation is required.

Hyposensitization to the oils and resins of various vegetations which cause contact dermatitis has been reported by various procedures. In poison ivy and oak, dilutions of the oil and resin have been given intramuscularly and by mouth. It would seem unwise to administer them during an attack, but they may be used for prevention. Shelmire reported development of a negative skin test and clinical immunity from the oral administration of increasing doses of the resin of poison ivy. Gold recently used enteric covered tablets of such resin in increasing doses. The protection may last for only six to eight months. Dilutions of oils of the leaves of various vegetations which produce contact dermatitis, especially of ragweed, cocklebur, helenium and the sages, have been used. Results from intramuscular therapy have been discouraging. Shelmire, however, increased protection by giving the diluted plant oil orally before the seasonal dermatitis began; first with increasing doses of a 1 to 100 dilution, then with similar doses of a 1 to 50 and later a 1 to 25 dilution. Sesame or corn oil may be used for such dilutions if the patient is not allergic to them. The dose must vary according to the patient's tolerance. The writer has found that much weaker dilutions (1 to 100,000 or weaker) are necessary to prevent exaggeration of dermatitis during the season. The oil may be given in a gelatin capsule to prevent dermatitis of the lips and soreness of the mouth and throat. Further experience with the plant oils gradually will determine their therapeutic value.

Evidence points to the benefit of hyposensitization with the specific pollens of the weed or tree rather than with the leaf or pollen oil to which the patient gives a contact reaction. Several patients with contact reactions to sagebrush, mugwort, and cocklebur have been completely relieved with prolonged pre-seasonal pollen therapy A few have been helped by co-seasonal therapy with pollen antigens, as described on page 39. Such relief may be due to small amounts of the specific oil in the pollen, though most pollens are cleaned with ether before they are used. Favorable results have also been reported from hyposensitization with ragweed pollen antigens in patients with contact reactions to the ragweed oil.

Hyposensitization with various dyes, with chemicals of all types, with

patients who have these manifestations, especially those whose history is suggestive of inhalant allergy. The choice of the inhalant allergens, and the technic and interpretation of the test are discussed in Chapter II.

As in most patients suspected of food allergy, because of the fallibility of the skin tests *trial diet with elimination diets is advisable. Usually fruit should be excluded from the initial elimination diet*, because of the frequency of fruit allergy in these cases. Menus for fruit-free elimination diets are detailed on pages 168 to 170. Allergy to one or two, or to all fruits may exist. Sensitization to allergens in uncooked vegetables also may occur as well as allergy to tomato. After relief has been obtained, the cooked or canned fruits in the routine elimination diets may be added gradually. As in all food sensitive patients, the *manifestations may* recur decreasingly for days or weeks, even when the causative allergens have been entirely eliminated. As stated on page 135, this condition is probably due to the persistence of the food allergens in the body tissues, especially in those of the shock organs, for varying periods of time. Allergy to fruits may continue for weeks, months, and in a few patients, for years. When they are excluded from the diet, vitamin C from 50 to 100 mg. by mouth should be added. As discussed on page 146, if allergy to cevitamic acid (vitamin C) also exists, then those vegetables which contain most of this vitamin (as discussed on page 21) should be stressed in the diet. After tolerance to fruits is determined, other foods in the elimination diets and all additional foods may gradually be added, as advised on page 143

When bacterial allergy is present, complete eradication of the *foci of* infection is imperative. In some cases, these bacterial allergens also persist in the body tissues for weeks or months, and cause continued or recurrent symptoms. Proper vaccine therapy, discussed on page 92, may be necessary Allergy from the decay in several teeth apparently caused urticaria in one patient. *Infectants* of all types must be eradicated. When allergy to fungus allergens exists hyposensitization may be necessary. Relief from hypersensitivity to various insect bites, including those of fleas, can be obtained with specific allergenic treatment, as noted on page 49.

When inhalant sensitizations are possible causes, as evidenced by history or skin reactions, hyposensitization with properly prepared antigens, as discussed in *Chapter III*, becomes necessary. Several patients with seasonal urticaria due to pollen allergy have been relieved by specific pollen treatment. The final diagnosis of inhalant allergy may depend on the results of hyposensitization.

When cold or heat allergy occurs, a histamine or a histamine-like (H) substance presumably is released by the affected body cells. Thereafter for twenty-four or more hours further histamine cannot be produced b[illegible] these cells. Relief or benefit [illegible] develops from baths a[illegible] toms. Thus, accordi[illegible] [illegible] cold-sensitive patients, if a bath of 60° F. produces severe hives, one of 70° F. may be given for

infections, monilia, especially in the colon, or from animal parasites in the gastro-intestinal tract or in other body tissues. Urticaria may also arise from one or more *bites of mosquitoes, mites, bees, yellow jackets, wasps, and bedbugs.* Flea bites produce an eruption simulating urticaria and generalized urticaria from one or two flea bites may occur. *Inhalant allergy,* especially from pollens, but also from dusts, animal emanations, spores of fungi and miscellaneous inhalants as discussed in Chapter III, causes urticaria in occasional patients. A history of urticaria during the spring, summer and fall should suggest pollen allergy.

Physical allergy as a primary and more often a secondary cause of urticaria and also of angioneurotic edema has been discussed on page 96. Alexander recommended that physical allergy be considered as the cause in all intractable cases. *Cold allergy* is indicated by a marked increase of hives during or after sitting for five minutes in a tub of water at 60° F. Cold allergy also is suggested if swelling of one hand occurs after it has been submerged for five minutes in water of 8° to 10° C., as suggested by Horton. If an accelerated pulse rate or a lowering of blood pressure develops during a [illegible] nd immersion, [illegible] water. Death [illegible] *Heat allergy* may be indicated by the increase of hives or other allergic symptoms after sitting for five minutes in a tub of water at 102° F., or by hives which arise during active exertion. *Light allergy* usually is suggested by the patient's history.

Some students believe that neuroses are responsible for these and other manifestations of allergy, as noted on page 97. However, it is the writer's opinion that nervousness rarely is the primary cause, but that it may activate underlying allergies as do physical stimuli.

The minority of our patients with chronic urticaria or angioneurotic edema have failed to respond to the proper study and treatment. These unrelieved conditions presumably are due to *intrinsic allergy* (see page 96).

The determination of the allergenic causes of urticaria and angioneurotic edema requires a carefully recorded history, as suggested on page 20, from which the probable type of allergy can often be surmised. Positive skin reactions to foods productive of urticaria and angioneurotic edema are especially difficult to obtain by the scratch test except for those large ones which occur when foods produce marked symptoms soon after ingestion. In such cases, the patient usually is aware of his specific allergies and the positive skin reaction is superfluous. Although the negative skin reaction does not rule out food allergy, and positive reactions, especially by the intradermal test, often are not indicative of clinical allergy, it is, nevertheless, advisable to test the patient by the scratch method, as recommended on page 24, with all important ingestant allergens. Tests with all important inhalants, including a few pollens, and subsequent intradermal testing with important inhalants which have failed to react by the scratch method, are also advisable in most

should be continued thereafter. Serious reactions similar to the "alarm reactions" which result in gangrenous appendicitis in animals have not been observed by Alexander except possibly in one case. Histamine therapy, as described, should not supplant persistent study and treatment of the allergies which are the cause of the disturbance in the majority of the cases Its effect, moreover, often is disappointing.

The itching and burning of urticaria may be alleviated by local therapy. A *colloidal bath** and subsequent patting of the skin with a towel until it is fairly dry may give relief. This procedure may be repeated several times in twenty-four hours. Cold or iced compresses at times are helpful. Various lotions containing small amounts of phenol, menthol, calamine or other antipruritic agents, as recommended in text books on dermatology, especially in Sulzberger's recent book, may be used.

The urticaria of serum sickness requires therapy as outlined. Histaminase by mouth may be of benefit. The precautions advisable in the administration of serum, especially to allergic patients, are discussed on page 218.

GENERALIZED EDEMA

Generalized edema or extensive edema of large parts of the body may arise from allergy and may last for a day or so or may persist with variations for long periods of time. It may cause an increase of from 5 to 15 pounds in weight in a few days. It may continue until the causative allergens cease operating or it may disappear when the allergic reactivity is exhausted and refractoriness to the causative allergens arises. Then, in varying periods, as the allergy in the tissues mounts it may recur. *It often is associated with allergic toxemia* characterized by drowsiness, mental confusion, and fatigue due in part to cerebral edema as discussed on page 126 Headache and a low-grade fever may also occur.

Food allergy and occasional bacterial allergy are the most frequent causes of generalized edema. Inhalant allergy should also be kept in mind, though the writer has never seen it operative, in this condition.

The diagnosis and treatment of this syndrome is similar to that already discussed for urticaria.

DERMOGRAPHIA

Dermographia is characterized by easy welting of the skin when it is pressed, stroked or struck. It must not be confused with true urticaria. A rapid release of histamine-like substances may be responsible for this reaction. So-called intrinsic allergy or non-specific causes which release histamine (H-substance) from the cutaneous cells have been incriminated. The writer believes, however, that patients often have a long standing underlying or potential allergy and that its gradual and proper control would reduce and, at times, eradicate the dermographia.

* To prepare a colloidal bath, Alexander advised 8 tablespoonfuls of soluble starch made into a paste with cold water, to which are added 6 tablespoonfuls of baking soda. A quart of boiling water is added slowly to prevent foaming. After thorough stirring the mixture is poured into a tub one-third full of warm water.

ten minutes daily until no urticaria occurs. Then a gradual reduction in the temperature according to the patient's reaction may increase tolerance so that a daily cold bath or shower at 60° F. finally controls the symptoms. Increase in tolerance for heat may result from a gradual daily increase in the temperature of the bath or by increasing exercise. Histamine therapy also may be of benefit in these thermal-sensitive patients.

Other less common causes of these manifestations need the special attention advocated in larger text books and in the literature of allergy.

Until the allergenic causes of urticaria and angioneurotic edema are determined and eliminated or controlled with proper therapy, *the relief of the pruritus and a reduction of the swellings often are urgent.* This is especially true if the swellings are in the larynx threatening respiration, in the tongue and throat preventing adequate nourishment, or in the gastro-intestinal tract causing severe pain, vomiting or other symptoms. *Epinephrine 1 to 1000* in from 0.2 to 0.8 cc. doses given hypodermically according to age and repeated every ten to sixty minutes for several days as necessary for relief is of most benefit. *The inhalation of 1 to 100 epinephrine* as described on page 102 usually fails to relieve hives or cutaneous allergic swellings. The oral or intravenous administration of calcium is of no value and peptone therapy along with urotherapy advised a few years ago is useless. Autohemotherapy, likewise, has failed in practically all cases.

Recently, the oral administration of *histaminase*, a ferment which breaks down histamine, has been advised. This medication is of questionable value and its use in this and all other allergic manifestations has been discontinued by most allergists. The hypodermic administration of histaminase also has been recommended but its value has not been demonstrated. Recently, Arthus-like necroses have been reported from such injections.

Alexander, Horton and others have recommended *parenteral histamine therapy in urticaria.* It is assumed that thereby tolerance for histamine is increased. The initial dose may be .05 cc. of a 1 to 10,000 dilution of histamine diphosphate administered subcutaneously This may be increased according to Alexander's schedule (see page 231). If systemic symptoms consisting of flushing, headache, tachycardia, dyspnea and dizziness occur with the larger doses, a slower increase in dosage or a lower dose may be required. Benefit is unlikely if the medication fails after 15 to 20 injections.

For intravenous administration, Alexander advised 0.2 mg. (0 2 cc. of a 1 to 1000 dilution) of histamine diphosphate diluted in 20 cc. of sterile physiological salt solution. This dose may be given with a No. 24 or 25 gauge needle, 1 cc. at a time, the speed depending on the degree of resultant discomfort. Diluting it in 100 cc. of saline and giving it intravenously by gravity during a twenty to thirty minute period may be preferable. A dose of 0.4 mg. on the following day and of 0.6 to 1 mg. forty-eight hours later according to the patient's previous tolerance then are advised. If relief is obtained subcutaneous treatment as outlined

As stated on page 131, erythema nodosum probably is due to vascular allergy. The other so-called erythemas are practically all due to allergic states. The fact is that most eruptions of the contagious diseases are the results of specific allergy to the infectants concerned.

GASTRO-INTESTINAL ALLERGY

Allergy may cause reactions in the mouth, throat, esophagus, stomach, intestines, rectum, and anus depending on the areas which are specifically sensitized. Other manifestations of allergy may also occur in the same patient. As insisted upon throughout this chapter, *allergy as well as all other recognized causes of gastro-intestinal disease must receive thorough consideration.* While the investigation proceeds food allergy may be studied by prescribing the elimination diets, rather than an ordinary soft or smooth diet which gives no thought to possible allergy. The food in the elimination diet, as suggested later, if necessary may be ordered in a smooth, puréed or minced form.

The writer's opinion that food allergy is a frequent cause of gastro-intestinal symptoms is based on the fact that relief and reproduction of symptoms follow the elimination and reintroduction of specific foods in the diets. The existence of irritation rather than of specific sensitizations is stressed by Alvarez All patients must be carefully studied from the physical and laboratory viewpoints to rule out other well recognized causes of symptoms. In the writer's opinion, *the failure to realize the frequency of gastro-intestinal allergy* is due to the infrequent consideration of food allergy as an important cause of the symptoms and to the improper and inaccurate use of trial diet, especially of the elimination diets for the study of food allergy when it is suspected. Until gastro-intestinal allergy is more generally recognized, physicians will fail to relieve many patients with acute and more often chronic symptoms.

Oral and Pharyngeal Allergy.—Physicians and especially dentists must recognize the allergic lesions on the lips and in the mouth and throat. *Cheilitis*, which is characterized by erythema, edema, vesiculation, oozing, and crusting of the lips, may arise from contact allergy to ingredients in mouth washes, toothpastes, dental floss, cigarettes, foods, contacted metallic or lacquered articles, or medicines. Dyes in lipstick, [illegible]

[illegible] maceration, or fissuring of the corners of the mouth, may be due to food or to contact allergy. Riboflavin deficiency also may cause these lip lesions *Hives or angioneurotic edema*, due to food and less often to drug or bacterial allergy, may affect the lips. *Recurrent cold sores* may be due to or activated by food or drug allergy. Allergy (see page 49) is responsible for most swelling from insect bites.

Inflammation of the oral mucosa (*stomatitis*), of the gums (*gingivitis*),

ACNE

The beneficial results from elimination diets in acne vulgaris obtained by the writer since 1931 were discussed *in his text book in 1937. White* in 1934 and Cormia in 1940 reported similar benefit with elimination diets. Such results naturally have suggested food allergy as a cause. This also is indicated by the rapid increase of acne after the addition of specific foods, especially milk, egg and chocolate. Allergic etiology, moreover, is suggested by acne due to iodides in susceptible patients and by seasonal acne from pollen.

For years, it has been known that "rich foods" increase acne. Recently good results similar to those from elimination diets have been reported by Sutton by treatment with low-fat diets. Milk, butter, chocolate, bacon, fats of meats, oils and shortenings are excluded. He attributed acne to pustular epidermal lipoidosis due to improper metabolism of lipoids and recommended thyroid extract when hypothyroidism existed, to increase lipoid utilization. In about 10 per cent of his patients with acne, he also used a low-carotene diet when rosy yellow or xanthoma-like lesions occurred.

As a result *of the use of fat-free diets during* the last few years, *the writer agrees with Sutton's conception that lipoidosis is the common cause of acne. Evidence still arises, however, that specific food allergies also are responsible* for the recurrence or exaggeration of some acne-form lesions and especially of an associated dermatitis. The fat-free diet may be obtained by using elimination diets from which oil, fats of meats, and more than moderate amounts of bakery products which contain much shortening have been excluded. *This diet also allows study of possible* food allergy. To increase the calories and assure weight maintenance, the carbohydrates, sugar, and syrup in this diet must be increased. Such a diet must be continued for several weeks until definite improvement has resulted. Then other foods may be added, as advised on page 143. Fat-containing foods must be excluded for months or possibly for longer periods in most cases. Exaggeration or recurrence of eruption after the addition of non-fatty *foods would suggest allergy.* Sutton's original articles on this subject which were published in the last three years should be consulted.

The possible production of acne by iodized salt is still under consideration, and the ability to tolerate it when thyroid is given, as suggested by Sutton, is being studied. When reduced resistance to skin bacteria is shown by definite pustules, autogenous vaccines are used. Dermatological *therapy including x-ray* treatment is reserved for the minority of patients who do not respond satisfactorily to diet manipulations.

Miscellaneous Cutaneous Manifestations.—The possible rôle of allergy to bacterial, ingestant or inhalant antigens in lupus erythematosus has been suggested *by various students. A thorough study of a group of* these patients needs to be done.

Gastric Allergy.—Gastric allergy, associated with congestion or inflammation of the mucous membrane or smooth muscle spasm, may give rise to burning or pyrosis, cramping, belching, regurgitation, distention, nausea and vomiting in varying degrees and combinations. When pyloric spasm or impaired peristalsis occurs, vomiting may arise. *The possibility that peptic ulcers may arise as canker-like lesions from allergy* is suggested by the clinical experiences of some allergists.

Intestinal Allergy.—Allergy in various parts of the *small intestine* may result in symptoms similar to those of gastric allergy. Localized cramping or pain in other pa[illegible] be due to localized allergy. [illegible] or soreness in the cecum, in [illegible] colon, and in the sigmoid or r[illegible] *Mucous colitis* often is due to allergy, and was described in the past as "asthma of the bowel" Long-standing constipation, the so-called *irritable bowel*, distended colon or a sensation of incomplete bowel evacuation and so-called tenesmus [illegible] relieved by [illegible] and occasio[illegible] with pollens.

As stated on page 119, *localized edema in various parts of the intestine may cause severe abdominal pain and even signs of intestinal obstruction*, and may lead to unnecessary surgery. So-called "cecal and appendiceal allergy" also has been responsible for many appendiceal operations. However, when surgery is definitely indicated, it should never be postponed, even if possible allergy has not received adequate study. Allergy and infection may co-exist in the same patient.

In infancy, *colic often is due to food allergy* to milk and less frequently to eggs, wheat, and fruits. Bleeding from the bowel or melena, due to increased permeability in the capillaries of the mucosa, may arise from food allergy Food allergy has also been responsible for pylorospasm in certain infants, as reported in the literature. The other gastro-intestinal symptoms described may also occur in infants and young children. *Recurrent or cyclic vomiting* frequently is due to food allergy. It is often associated with headache and may be a forerunner of sick headaches or migraine in later life.

Finally, *spasm in the anal muscles and pruritus or itching* [illegible] *the anus* may be due to [illegible] e anal [illegible] Pru- [illegible] and a [illegible] and to fungi, particularly to monilia in the intestinal tract.

Chronic Ulcerative Colitis —The cause of this disease frequently may be due to allergy Andresen first made this suggestion in 1933 and recently published several confirmatory articles Mackie in 1939 concluded that food allergy was an important etiological factor in 65 per cent of his series of 67 cases The colon may be the site of localized

or of the tongue (*glossitis*), may arise from food or drug allergy as well as from infection or irritations from carious teeth or from poorly fitting c[illegible] T[illegible] F[illegible] the oral mucosa, or burning and tingling of the tongue. Pricking or burning of the tongue or a metallic taste may be due to allergy. Swellings of the tongue, gums, oral mucosa, or pharynx may arise from food allergy. The "geographic tongue" may be due to allergy, especially to food allergy. Burning, tingling, and congestive lesions may arise from the galvanic reaction between gold, nickel and amalgam in dentures and filings. The typical lesions of nicotinic acid and riboflavin deficiency in the oral mucosa especially of the tongue must be recognized.

Aphthæ or canker sores usually are due to food and less often to drug, denture, or bacterial allergies. When secondarily infected, serious inflammations may arise. The frequency of food allergy, especially to fruits as a cause of canker sores, suggests the use of trial elimination diets as described in this book.

Vulcanite and other synthetic dentures may produce allergic stomatitis or gingivitis with redness, vesiculation, blebs, excoriations, cracking, and oozing. Allergy to a single dye, to mercury, to rubber, or to other mineral substances may occur. Patch tests with all ingredients may show the specific cause. Allergy to hecolite with positive patch tests on the skin is not uncommon.

Agranulocytosis, which produces ulcerative, necrotic stomatitis, leucopenia, and an absence of the granular cells in the blood, probably is due to allergy in the blood-forming cells of the bone-marrow. Amidopyrine as well as arsphenamine, gold salts, cincophen, dinitrophenol and sulphanilamide have caused agranulocytosis.

Oral, as well as cutaneous, lesions may occur from anesthetics, such as novocaine, procaine, butyn, and apothesine in patient, dentist, and assistant. Other drugs, antiseptics, and mouth washes used in dental work may cause localized allergy.

Orthodontia often becomes necessary in children because of nasal allergy to foods or inhalants which cause blocking of the nose, a high palate, and a narrow and protruding upper dental arch.

A coated tongue and halitosis may be due to food allergy which has caused localized allergy in the stomach or intestines with resultant mild or marked reversed peristalsis. Postnasal mucus, accompanied by throat clearing and hacking may also cause a coated tongue and often is due to food or inhalant allergies. Localized allergy in the pharynx may produce recurrent irritation, congestion, or soreness which is often mistaken for infection.

In the *esophagus*, allergy may produce swellings or spasms and may be the cause of some cases of globus hystericus. Spasm of the lower end of the esophagus (cardiospasm) may arise from allergy which impairs proper entrance of food or fluid into the stomach.

avitaminosis, relief of symptoms should gradually occur without the continued use of such medicaments

For diet trial, *a modified fruit- and cereal-free elimination diet* as detailed on page 191 is used by the writer.

Localized allergy undoubtedly affects the liver in varying degrees and areas. The extent of decreased hepatic function and reduced flow of bile which arise from possible allergy is difficult to measure. Allergic congestion and spasm in the gall-bladder and biliary tract may give rise to symptoms of biliary colic or gall-bladder disease. As pointed out by ... the necessary diagnostic considera- ... It may also affect the pancreas,

The study of possible gastro-intestinal allergy requires the same carefully recorded history, the limited information from skin testing, and especially the use of diet trial with various elimination diets as already outlined in the previous sections of this chapter. Sensitization to several or even all fruits as in urticaria is not infrequent. Therefore the initial use of a fruit-free elimination diet (see page 168) or the use of such a diet after the routine elimination diets with or without cereals (see page 156) for an adequate period may be required. Supplemental diets, as described on page 147, may be necessary in patients suspected of food allergy who do not respond to the routine elimination diets. The use of a puréed, liquid or soft diet containing the foods in the selected elimination diet may be necessary, especially if diarrhea, mucous colitis or an irritable bowel is present, as discussed on page 147 Drug allergies, or the occasional bacterial and pollen allergies may be causes of gastro-intestinal symptoms

For the temporary relief of acute symptoms, the use of epinephrine as discussed under bronchial asthma may be helpful. Relief necessarily does not occur The use of histamine, calcium and other non-specific therapy has been of no value in this type of allergy

In all patients suspected of allergy, and especially in those with gastro-intestinal ... *y studies must be made* ... not be over-looked ... the stomach ...

... analysis should be made of the dietary habits and an approximate estimation of the amounts of vitamins, proteins and minerals eaten during previous months and in some patients for years past. It is important to recognize the *nervous indigestion* so well emphasized by Alvarez which occurs in the introspective, neurotic, unstable person who even may be suffering from a mild or pronounced psychosis. The presence of ... and men must ...

allergy to food, or to other types of allergy, including bacterial allergy. Allergic inflammation with varying degrees of ulceration may be the initial manifestation. Later, secondary infection with resultant cellulitis, formation of scar tissue and extension of ulcerations may lead to the advanced lesions.

During the last five years the writer has studied chronic ulcerative colitis from the allergic viewpoint. In addition to the 15 patients who were reported in the Annals of Internal Medicine (1941), 6 patients have been treated. In 9 of these 21 cases, excellent relief was obtained with the good coöperation of the patient. In these, food allergy seemed a major cause of the symptoms. In 3 others, the good results obtained probably would have been better if the patients had adhered more strictly to the diets. One patient who had had seasonal ulcerative colitis, from mid-July to December, for nine years, was controlled for two years with pollen hyposensitization. Of the 8 remaining patients who were not controlled with elimination diets, 3 had ileostomies and subsequent colostomies with excellent results, 2 failed to respond to any treatment and refused surgery, and 3 apparently improved with elimination diets and additional medical treatment.

Before a diagnosis of chronic ulcerative colitis can be made, other possible causes of diarrhea must be ruled out. Important among them are: bacillary, amebic and parasitical agents, intestinal tuberculosis or malignancy, acute bacterial or virus infections and achylia.

Allergy, especially to foods, should receive thorough consideration in all cases of ulcerative colitis. It is most likely to be a factor in the early fulminating cases and in the subacute or chronic cases in which fever is not marked or is absent In chronic ulcerative colitis with persistent fever, the diet may be used provided nutrition is maintained and sepsis and perforation do not threaten. Relief usually is evident in from one to four weeks if food allergy is of etiological importance. When fever is intermittent or absent, diet trial is justified for longer periods if weight and nutrition are protected. Adequate vitamin therapy, parenteral liver extract, blood and plasma transfusions for anemia and hypoproteinemia, and the sulfonamide drugs especially sulfaguanidine or possibly the newer succylsulfathiazol, should be used along with the elimination diets according to the indications in each patient. The importance of surgery in severe, intractable cases has been discussed by Cave in 1939.

Though evidence does not assure possible bacterial allergy or the Schwartzman-Sanarelli type of reaction as a major or complicating cause in chronic ulcerative colitis, it must always be considered. If stock or autogenous vaccines are used, initial small doses must be given before larger doses are used so that possible exaggeration of the disease is prevented. Intravenous typhoid vaccine may benefit persistent fever due to colonic infection. Atropine, tincture of opium, codein, tannates, bismuth or kaolin may help the diarrhea though with the control of allergy and the secondary infection, anemia, hypoproteinemia and

symptoms may also be due to concomitant allergy in the gastro-intestinal tract

Whereas *food allergy is the most common cause of allergic migraine and headache, inhalant allergy of different types occasionally is responsible.* Therefore, the history must be taken as outlined on page 20 with all types of allergy in mind. Skin testing with food allergens by the scratch method may be a routine procedure, though little helpful information can be expected from it in the majority of cases. Scratch and intradermal testing with important inhalants should be done whenever any indication of possible inhalant allergy exists. The negative and positive skin tests as discussed on page 13 must be properly evaluated.

For the study of possible food allergy, elimination diets, as described in Chapter V, should be used accurately and for adequate periods of time. As stressed in this volume, nutrition must be protected. The time necessary for diet trial and for an eventual building of tolerance to allergenic foods is discussed on pages 135 and 142. When inhalant allergy is likely, the diagnostic and therapeutic recommendations outlined in the section on Bronchial Asthma must be followed.

While the various causes of migraine and recurrent sick headaches are being studied and diet trial is progressing, the attacks themselves usually can be relieved with *ergotamine tartrate,* in doses of 0.25 to 0.5 mg. given hypodermically and repeated, if necessary, in two or three hours. The resultant discomfort may contraindicate its use. The prolonged use of ergotamine tartrate may produce gangrene of the extremities, especially in patients with vascular disease. Moreover, it apparently postpones the attacks of migraine Therefore its frequent administration may be necessary and it may become habit-forming The oral administration of from 1 to 2 mg. before an attack repeated every three to six hours but not oftener than four times in the twenty-four hours, may give relief. Neogynergen, which contains the more rapidly acting ergonovine, may produce less discomfort and may act more effectively than ergotamine tartrate. Epinephrine, 1 to 1000, in doses of 8 to 15 minims, given hypodermically over a period of three to five minutes may be of benefit.

Alvarez advised against overwork, excitement and worry and advocated psychotherapy He also used the inhalation of 100 per cent oxygen by the B L.B mask with benefit to migraine Relief may be obtained from [illegible] *lein* in from ¼ to 1 grain [illegible] *Barbitals, bromides, and* [illegible] situation. Some of these patients are benefited by saline cathartics, by bile salts with or without phenolphthalein or by colonic flushings or enemas. Sometimes relief occurs in those who later are found affected with food allergy. Bacterial allergy from colonic organisms also may be suggested if relief is obtained from enemas. The writer would again stress the frequency [illegible] *migraine and rec*[illegible] tion diets accur[illegible] allergens in two [illegible]

These are a few of the diseased states, more fully discussed by the writer in his larger text and by various allergists and internists, which must be considered in the differential diagnosis of a patient who is suffering with possible gastro-intestinal allergy.

ALLERGIC MIGRAINE, SICK HEADACHES AND RECURRENT VOMITING

For fifteen or twenty years, *Vaughan, the writer, and other allergists have stressed the allergic etiology of many cases of migraine and sick headache. Allergy also causes cyclic vomiting* with or without headache in childhood, as noted on page 131. The elimination of allergenic foods gives good or excellent relief in approximately 60 to 70 per cent of these patients. It is possible that with the perfect cooperation of the patient and the accurate use of elimination diets, as described in this volume, a larger number of patients would be benefited. Recurrent allergic headache may be noted only at the menstrual period because of heightening of allergic reactivity at that time, as discussed on page 97.

A dull frontal or a generalized headache may be associated with definite nasal and sinal allergy. Aching and pain in the nasal and sinal tissues usually occurs. The headaches are more persistent than in migraine, and are neither recurrently exaggerated nor associated with nausea and vomiting as are those of the migrainous type.

Sensations of tightness, pulling and aching in the back of the neck, shoulders and upper back may occur with these recurrent headaches or may exist independently with or without other allergic manifestations. Relief [illegible] -ningeal or peripheral [illegible] responsible. Neuri- [illegible] the upper cervical vertebræ or their processes also are responsible for such symptoms.

As in all symptoms which may be due to allergy, so also *all other pathological conditions must be investigated in these patients* with the aid of proper histories, physical examinations, and laboratory studies. The ocular and nasal headaches, and those which arise from disturbances in the digestive and biliary functions and from chronic diseases other than allergy must be kept in mind In differential diagnosis allergy needs constant consideration.

It is impossible to ascertain whether the allergic reaction produces edema and congestion of the meninges, or arterial spasm with increased vascular permeability and edema of the adjacent cerebral tissue. The allergic reaction is localized in certain areas of the brain and meninges. At times it extends downward into the nasal and sinal tissues. Thus the different degrees and locations of headache, ocular symptoms, disturbances in hearing or smell, paræsthesias and pareses are explained. The cyclic recurrence of the symptoms is characteristic of allergy, especially to foods, as noted on page 55. Many patients have reflex gastro-intestinal symptoms. Nausea, vomiting and other abdominal

allergic investigation is fully warranted. As in all patients suspected of allergy, the study must be conducted according to the methods outlined in this volume and with the absolute coöperation of the patient.

NEURAL ALLERGY*

Localized allergy in various peripheral nerves may occur, especially from food allergy The paresthesias and pareses, and even paralyses which develop in serum sickness, exemplify the possibility of other types of allergy that may affect the spinal cord, the peripheral nerves, and the membranes of both. Therefore, neuralgia and peripheral pains which resist ordinary therapy may, in a few patients, be due to food or other allergy. Neuralgic pains in the chest, arms, and shoulders which suggest possible angina pectoris may be due to food allergy. Adequate cardiac examination, of course, should rule out heart disease. Likewise, neuralgic pain in the lower back and legs may be due to food allergy. Synovial membrane allergy, as discussed on page 128, also may be present. Patients with *dizziness* and some with *Ménière's syndrome* need to be studied from the allergic viewpoint, especially as to food allergy.

OCULAR ALLERGY

Conjunctival and scleral congestion, redness, watery or mucoid discharge with itching and light sensitiveness suggest allergic etiology and may or may not be associated with seasonal or perennial nasal allergy or bronchial asthma Any of the inhalants, described in Chapter III, especially pollens, dusts, orris root, pyrethrum, karaya gum, kapok, cottonseed, and animal emanations, may be responsible. When ocular allergy is severe and persistent, *vernal catarrh* may develop. The cobblestone-like changes in the conjunctiva are probably polypoid in nature. The lesions of the lids simulate those of trachoma. Recently Bowen reported good results with the injection of oil antigens of causative pollens.

Food allergy may produce chronic conjunctival and scleral allergy. In these cases the symptoms usually are non-seasonal. Food allergy also may cause photophobia and irritation of the eyes with mucoid discharge, but without severe itching Symptoms of three years duration in one patient were due to allergy to several foods including fish. Cod liver oil, to which ocular allergy existed, had been given for two years because of its vitamin A content. The fact that itching of the nose in nasal allergy due to food may be absent or minimal was discussed on page 106.

Drugs may produce ocular allergy. Some of these are: belladonna, mercury, zinc, quinine, chloral, cocaine, and other analgesics. They may [illegible]

in the ocular mucus. The fact that corneal ulcers frequently occur in allergic patients emphasizes the possibility of their allergic origin.

* Cerebral allergy *from foods* and less often from pollen, drugs and bacteria may produce stupor, coma, convulsions and cranial nerve involvements.

ALLERGIC TOXEMIA

Food allergy and, less often, pollen allergy, may produce drowsiness, stupor, inability to concentrate, fatigue, generalized or joint and muscular aches, susceptibility to chilling, and exhaustion. Cerebral or meningeal edema and allergic reactivity in other tissues including the joints, nerves, muscles and possibly the liver, may be responsible for these symptoms. Toxemia often is present in patients with allergic migraine and sick headaches and usually occurs with generalized edema and sudden increases in weight as discussed on page 117. *A low-grade fever,* which may recur intermittently for many months or years, may be due to uncontrolled chronic allergy. Occasionally higher persistent or recurrent fever occurs. (See page 130.)

Other manifestations of allergy may be present. Nasal congestion, watery discharge, and sneezing may be due to the same allergic reaction in the nasal and sinal tissues which is causing the cerebral edema. The localized allergy in the area including the nasal tissues and in the adjacent cerebral and meningeal tissues is evident. *Generalized aching in muscles and joints and chilling of the body* which occur when the allergic reaction becomes intensified, probably are due to a generalized allergic tissue reactivity in addition to that in the brain.

When *food allergy* is suspected, a study similar to that suggested in the discussion of allergic migraine is necessary. *Pollen toxemia,* which usually is associated with hay fever, asthma, or allergic dermatitis, must be treated as described under Bronchial Asthma.

All other possible causes of these symptoms should be determined by a complete physical and laboratory examination Hidden foci of infection, especially in the jaws, prostate, nose and throat, must be discovered. The patient should not be treated for allergy when any other disease is the cause of his symptoms.

EPILEPSY

Allergic epilepsy, associated either with convulsions or with petit mal manifestations, has been reported frequently enough by allergists to emphasize the importance of considering allergy as one possible cause in all so-called idiopathic cases A study of allergy is especially necessary in young children and adults in whom all neurological and other examinations have failed to reveal the etiology. *Food allergy* has been incriminated in certain patients and *inhalant allergies* to animal emanations, miscellaneous allergens, dusts, and pollens, have been proved responsible in a few cases. One patient had typical Jacksonian attacks which started in the small finger of the right hand Egg allergy, which was not demonstrated by skin reaction, was the sole cause. Another patient with recurrent petit mal and occasional grand mal attacks, especially in the spring, was definitely relieved with pollen hyposensitization and with elimination of allergenic foods. These experiences stress the importance of a thorough

...epilepsy.

tine

allergic manifestation, or may be accompanied by any of those discussed in this chapter. *Food allergy is their most frequent cause.* In 2 cases of seasonal hydrarthrosis of the knee joints a study of pollen allergy as a possible cause has been made. When the large joints are involved, the food excluded from the routine elimination diets, especially wheat, milk, and eggs, must receive primary study. Fruit allergy, as discussed on page 146, must also be considered, particularly when many of the small joints are affected. Bacterial allergy and infrequently pollen allergy, as stated above, may be responsible for a few of these reactions in the synovial membranes.

Bacterial allergy may play a rôle in chronic arthritis of the atrophic or rheumatoid type and especially in acute inflammatory rheumatism. It may arise from bacterial foci in teeth, tonsils, sinuses, pelvis, gall-bladder, appendix, rectum, prostate, and in other regions of the body. It may possibly develop from the mucosal bacteria in the nose, throat, bronchi or gastro-intestinal tract. Chronic arthritis also may be due to degenerative, or hypertrophic changes, to trauma, to metabolic and nutritional disturbances. These possibilities and the rôle of allergy in arthropathies have been more fully discussed in the writer's larger text-book on allergy.

UROGENITAL ALLERGY

The urogenital tissues may be the seat of localized allergy. They may be the main or the only shock tissues Usually, however, other manifestations of allergy are more pronounced *Bladder allergy most frequently occurs* Burning and frequent urination with cramping and urgency without urinary or cystoscopic findings indicate the possible presence of allergy. However, organic disturbances may be found along with bladder allergy. The so-called Hunner's ulcers which may be canker-like lesions in the mucosa of the bladder, may be due to localized allergy. *Allergy may affect the kidney, its pelvis, the ureter, and the urethra,* causing congestion, edema, spasm, and even colic similar to that due to kidney or ureteral stones Allergic inflammation, edema, or localized herpes or canker-like lesions may involve the external genitalia of man and woman. As with all symptoms suggestive of possible allergy, so also these should be investigated by thorough physical examinations, laboratory tests, indicated cystoscopic and x-ray studies before allergy can receive definite consideration.

The uterus probably is susceptible to allergic reactivity the same as other body tissues [illegible]
explain cases [illegible]
described. V[illegible]
occur. Leuc[illegible] allergy as does mucus from the bronchial mucosa in bronchial asthma and the mucus from the colonic membrane in mucous colitis

Iritis and uveitis usually are due to bacterial allergy from a distant focus of infection. Removal of the focus is necessary and careful hyposensitization with autogenous vaccines may be required. These lesions may also arise from food or inhalant allergy. A recent case of keratitis and former iritis with moderate scarring of the cornea lasting two to three days recurring in alternate eyes every week for two years was due to food allergy as determined with the writer's cereal free elimination diet. The allergic reaction may be influenced favorably by intravenous typhoid vaccine as advised on page 105. The reported benefit of tuberculin therapy in some of these cases may be non-specific rather than specific in its action.

Allergy to the lens protein apparently develops in some patients after removal of a cataract. When a second cataract is removed a severe reaction occurs in the operated eye due to the release of the lens allergen. *Uveal pigment allergy* may develop after a severe injury to the eye; two or three weeks later an ophthalmic reaction may occur from pigment allergy that may destroy sight and necessitate the removal of the eye.

Dermatitis of the lids or blepharitis associated with swelling, itching, oozing, crusting, or scaling of the skin of both lids may arise from food and especially from inhalant allergy. If it occurs from early spring into the late fall, various pollens must be suspected. Treatment with specific pollen antigens has been discussed on page 38. Contact allergy must also be considered. In perennial dermatitis, food allergy and various inhalants encountered throughout the year should be considered. Blepharitis may be the initial evidence of a spreading atopic or, less often, a contact dermatitis which may involve the face, neck, upper chest, back, flexures, and extremities, as described previously in this chapter.

ALLERGIC ARTHROPATHIES

Allergy may develop in the synovial membranes of the joints and in the tendon sheaths. Stiffness, swelling, soreness, and aching may result. A few or many joints may be affected. Deformity rarely occurs, although some evidence indicates that with prolonged chronic involvements it may arise. *A few patients with rheumatoid arthritis*, some of whom had chronically deformed joints, have been markedly relieved of pain, stiffness, swelling, and even enlargements. Therefore a study of possible food allergy in patients of this type seems to be indicated. For this study, the Fruit- and Cereal-free elimination diet (see page 167) is recommended, since extensive fruit allergy has occurred in a few of these patients.

The allergic reaction in the joints may be intermittent or more or less persistent. So-called *intermittent hydrarthrosis* of the larger joints probably is always due to allergy. These rather sudden swellings with fluid formation in the joints, especially in the knee, may persist for a week or more with practically complete freedom between the attacks, or they gradually may become chronic. These arthropathies may be the only

allergic manifestation, or may be accompanied by any of those discussed in this chapter. *Food allergy is their most frequent cause.* In 2 cases of seasonal hydrarthrosis of the knee joints a study of pollen allergy as a possible cause has been made. When the large joints are involved, the food excluded from the routine elimination diets, especially wheat, milk, and eggs, must receive primary study. Fruit allergy, as discussed on page 146, must also be considered, particularly when many of the small joints are affected. Bacterial allergy and infrequently pollen allergy, as stated above, may be responsible for a few of these reactions in the synovial membranes

Bacterial allergy may play a rôle in chronic arthritis of the atrophic or rheumatoid type and especially in acute inflammatory rheumatism. It may arise from bacterial foci in teeth, tonsils, sinuses, pelvis, gall-bladder, appendix, rectum, prostate, and in other regions of the body. It may possibly develop from the mucosal bacteria in the nose, throat, bronchi or gastro-intestinal tract. Chronic arthritis also may be due to degenerative, or hypertrophic changes, to trauma, to metabolic and nutritional disturbances These possibilities and the rôle of allergy in arthropathies have been more fully discussed in the writer's larger text-book on allergy

UROGENITAL ALLERGY

The urogenital tissues may be the seat of localized allergy. They may be the main or the only shock tissues. Usually, however, other manifestations of allergy are more pronounced. *Bladder allergy most frequently occurs* Burning and frequent urination with cramping and urgency without urinary or cystoscopic findings indicate the possible presence of allergy. However, organic disturbances may be found along with bladder allergy. The so-called Hunner's ulcers which may be canker-like lesions in the mucosa of the bladder, may be due to localized allergy. *Allergy may affect the kidney, its pelvis, the ureter, and the urethra*, causing congestion, edema, spasm, and even colic similar to that due to kidney or ureteral stones. Allergic inflammation, edema, or localized herpes or canker-like lesions may involve the external genitalia of man and woman. As with all symptoms suggestive of possible allergy, so also these should be investigated by thorough physical examinations, laboratory tests, indicated cystoscopic and *x*-ray studies before allergy can receive definite consideration.

The uterus probably is susceptible to allergic reactivity the same as other body tissues. Spasm in the musculature with edema of the mucosa might [illegible]

[illegible] may result from allergy as does mucus from the bronchial mucosa in bronchial asthma and the mucus from the colonic membrane in mucous colitis.

Iritis and uveitis usually are due to bacterial allergy from a distant focus of infection. Removal of the focus is necessary and careful hyposensitization with autogenous vaccines may be required. These lesions may also arise from food or inhalant allergy. A recent case of keratitis and former iritis with moderate scarring of the cornea lasting two to three days recurring in alternate eyes every week for two years was due to food allergy as determined with the writer's cereal free elimination diet. The allergic reaction may be influenced favorably by intravenous typhoid vaccine as advised on page 105. The reported benefit of tuberculin therapy in some of these cases may be non-specific rather than specific in its action.

Allergy to the lens protein apparently develops in some patients after removal of a cataract. When a second cataract is removed a severe reaction occurs in the operated eye due to the release of the lens allergen. *Uveal pigment allergy* may develop after a severe injury to the eye; two or three weeks later an ophthalmic reaction may occur from pigment allergy that may destroy sight and necessitate the removal of the eye.

Dermatitis of the lids or blepharitis associated with swelling, itching, oozing, crusting, or scaling of the skin of both lids may arise from food and especially from inhalant allergy. If it occurs from early spring into the late fall, various pollens must be suspected. Treatment with specific pollen antigens has been discussed on page 38. Contact allergy must also be considered. In perennial dermatitis, food allergy and various inhalants encountered throughout the year should be considered. Blepharitis may be the initial evidence of a spreading atopic or, less often, a contact dermatitis which may involve the face, neck, upper chest, back, flexures, and extremities, as described previously in this chapter.

ALLERGIC ARTHROPATHIES

Allergy may develop in the synovial membranes of the joints and in the tendon sheaths. Stiffness, swelling, soreness, and aching may result. A few or many joints may be affected. Deformity rarely occurs, although some evidence indicates that with prolonged chronic involvements it may arise. *A few patients with rheumatoid arthritis*, some of whom had chronically deformed joints, have been markedly relieved of pain, stiffness, swelling, and even enlargements. Therefore a study of possible food allergy in patients of this type seems to be indicated. For this study, the Fruit- and Cereal-free elimination diet (see page 167) is recommended, since extensive fruit allergy has occurred in a few of these patients.

The allergic reaction in the joints may be intermittent or more or less persistent. So-called *intermittent hydrarthrosis* of the larger joints probably is always due to allergy. These rather sudden swellings with fluid formation in the joints, especially in the knee, may persist for a week or more with practically complete freedom between the attacks, or they gradually may become chronic. These arthropathies may be the only

generalized spasm throughout the arterial system may be due to allergy, has suggested allergy as a cause of *essential hypertension* in some patients. The writer has studied many of these patients with allergy in mind. He encountered only one undoubted instance of hypertension due to food allergy, though in a few other patients slight evidence of vascular spasm due to food allergy was observed. Some cases of *angina pectoris* might be due to vascular allergy in the cardiac tissues, as suggested in few articles in the literature. The localized vascular lesions which characterize *erythema nodosum* also necessitate a study of possible allergy. Finally, *various cardiac irregularities*, especially paroxysmal tachycardia occur rather frequently in allergic patients. Favorable results have been reported from the control of ingestant or inhalant allergies in such individuals. Changes in electrocardiographic tracings have disappeared in some patients after their allergies were controlled. Evidence that intermittent auricular fibrillation and paroxysmal tachycardia may be influenced by food allergy has been reported in the literature and observed in the writer's work. As yet definite evidence has not been assembled that any of these manifestations are due to allergy. However, investigation of allergy as a possible cause of vascular lesions by the methods discussed in this volume is justified.

ALLERGY IN INFANCY AND CHILDHOOD

Infants and children are subject to many allergic manifestations, especially those who have a definitely positive family history of allergy. This is particularly true when marked allergy occurs in both sides of the family. Though many of these manifestations have been discussed in this chapter they deserve further emphasis.

Gastro-intestinal allergy is common in infancy. [illegible]

[illegible] pylorospasm is at times due to food allergy. In cases of pyloric hypertrophy the rôle of allergy is questionable. Canker sores usually are due to food [illegible]

[illegible] which is relieved by the [illegible] of allergenic foods. Anorexia especially from milk is discussed on page 68

Eczema occurs throughout infancy and childhood. Its identity with atopic dermatitis and its treatment have been discussed on page 109. Briefly, infantile eczema develops first on the face and later on the flexures of the arms and legs; at times it involves other areas of the body. Food allergy and less often inhalant allergy are its usual [illegible] As age increases [illegible]

allergy may be [illegible]

ALLERGIC FEVER

The fever resulting from allergy from *serum sickness* and from *drugs* is well known. This requires the consideration of other types of allergy as possible causes of fever. Severe pollen and probably other inhalant allergy may cause fever. *Food allergy especially may be responsible.* Such fever may occur during severe attacks of bronchial asthma not due to infection especially in children. Children with low grade persistent fever, at times associated with sweating at night, may be relieved with the elimination of allergenic foods. Some of the symptoms of nervous system allergy and of the other more common allergic manifestations also may be present along with the allergic fever. Food aversion, or disagreements and anorexia may indicate such food allergy.

One girl, aged seventeen years, had been hospitalized at complete rest for five months because of fever varying from 99° to 103° F. each afternoon and evening. She also had low abdominal distress, occasional diarrhea, frequent nausea, an increasing blood eosinophilia, a life-long anorexia and an aversion to milk, and mild symptoms of allergic toxæmia. (See page 126.) With the cereal-free elimination diet, her fever disappeared in four days. She gained 20 pounds in the next two months. Milk allergy especially was responsible for the fever and other symptoms. Thus food and other types of allergy must be considered in all fevers of obscure origin.

CARDIOVASCULAR ALLERGY

Rossle, Manwaring and others have suggested that the primary seat of most atopic allergy is in the vascular tissues and that other tissues are affected later. Since all atopic allergy is due to blood-borne ingestant, inhalant, injectant, or bacterial allergens, vascular sensitization needs definite consideration. Increased permeability of the blood-vessels with resultant transudation of fluid into the surrounding tissues is a very important result of allergy. Its location depends on the area in which the greatest localized sensitization exists. Smooth muscle spasm in the walls of the blood-vessels and even in the small islands of smooth muscle on the walls of the capillaries (Rouget cells) may be due to allergy. The contraction of the capillaries seen under a capillary microscope when tobacco smoke is inhaled may be the result of smooth muscle spasm due to tobacco allergy.

Because of the possibilities of vascular allergy, *various vascular symptoms and lesions have been studied from the allergic viewpoint.* Much evidence points to the probability that *thrombo-angiitis obliterans* may be due to ingestant or inhalant allergy, particularly to tobacco. The facts that eosinophilia is marked in most patients with *periarteritis nodosa* and that the microscopic necroses around the arterial vessels in the body tissues usually are filled with eosinophiles, have suggested an allergic etiology. *Allergic purpura* may occur. The possibility that

other possible pathology before allergy receives definite consideration. Tuberculin tests should be a routine procedure.

Both *petit and grand mal attacks* of epilepsy and various epileptic equivalents, as discussed on page 126, have been reported often enough as due to food and at times to inhalant and bacterial allergy that the possible rôle of allergy deserves consideration in all cases of so-called idiopathic epilepsy. Careful neurological investigations should be made before allergy is given prolonged study. *Some children, moreover, are nervous, irritable, incorrigible, drowsy, or unable to concentrate or to study effectively because of unrecognized or uncontrolled allergies.* Susceptibility to nightmares, insomnia, phobias, bursts of temper, sullenness, or depression may result from chronic allergy. *Enuresis* at times will disappear when allergy is properly treated.

Excoriations and chafing in infants require study of possible food allergies. Pruritus ani from allergic inflammation with consequent excoriation may arise from food allergy, or from allergy to infection with monilia or possibly other fungi.

Hives are common in these years and are often vesicular. The urticaria usually is due to fruit or egg and less often to other food allergies. The other causes of urticaria and angioneurotic edema, which are infrequent in infancy and childhood, as well as the methods of study and control of these conditions, have been discussed on page 113.

Contact allergy may occur at any age. Its causes have been noted on page 111. In early years it is not especially common, although allergy to fabrics, dyes, animal emanations, and vegetable resins, especially to those of poison oak and ivy may occur.

Recurrent head colds and intermittent or persistent nasal blocking, congestion and sneezing, with or without watery or mucoid discharge must always suggest allergy. In case of allergy the intoxication, fever and especially the red, inflamed mucosa which arise from an infectious cold are not present. Eosinophiles often are found in the secretions and a pale, boggy mucosa is evident. These symptoms are more fully discussed in relation to allergy on page 106. The importance of pollens as a cause of nasal and ocular symptoms in the spring, summer and fall, as well as of animal emanations, of various miscellaneous allergens and of house and environmental dusts as causes of perennial symptoms is there noted. Food allergy must receive consideration particularly when the symptoms are exaggerated from September to April, during which period food allergy is accentuated (see page 56).

Bronchial asthma or recurrent bronchitis may develop during late infancy. It usually occurs at the end of the second year, especially in cases of subsiding infantile eczema. As discussed on page 99, food allergy is the most common cause of bronchial asthma, especially when intermittent attacks occur. Inhalant allergy becomes more frequent as the years advance and may be the sole cause or a complicating one along with food sensitizations. The nasal symptoms for one or two days which so frequently precede attacks of bronchial asthma usually are due to localized nasal allergy especially to foods rather than to infection. With the control of allergy, the recurrent "colds" disappear along with the bronchial asthma. Moreover when infectious head colds occur, asthma may not arise provided the allergy is under control. The allergic nature of croup, in most instances, must be appreciated. A history of recurrent sore throats also should suggest possible allergy especially if the tonsils have been removed.

The so-called *allergic toxemia, the occurrence of fever without any evidence of infection, the undernourishment and impaired physical development, and especially the anorexia due to uncontrolled food and less often inhalant allergies*, have already been described in this chapter, and on page 126. Careful physical examination and laboratory tests must rule out all

Ever since the elimination diets were first proposed sixteen years ago, *the writer has stressed several important recommendations for their successful use in the discovery of possible food allergies.* (1) It is necessary to keep most patients on a given elimination diet for more than a few days. (2) Because the diets must be used for days or weeks during the investigative period, and for weeks and months thereafter when exclusion of specific foods is necessary for continued relief of symptoms, detailed explicit menus should be given to every patient who is studied and treated with elimination diets or any other trial diet. (3) When an elimination diet or any other trial diet is utilized for diagnosis of possible food allergy, it must be assumed that a maximum degree of allergy may exist to any of the foods excluded from the diet. It need no longer be pointed out that minute amounts of a food will produce symptoms in a patient who is afflicted with a high degree of allergy to that food. Even the odor of foods may produce allergic reactions. Therefore, the exclusion of foods from the trial diet during the investigative period must be complete if the maximum amount of food allergy is to be discovered. (4) With all elimination diets maintenance of nutrition and of proper weight must be assured

Since the successful discovery of food allergy depends largely on the adherence to the foregoing recommendations, they are more fully discussed in the ensuing pages.

TIME NECESSARY TO OBTAIN RESULTS WITH THE DIETS

Food allergy and other types of allergy which have existed for many months or for years, probably produce changes in the tissues which are persistent and, at times, irreversible. In order to restore the cellular structure and function to normal the injured tissues must be freed from the specific allergens to which they are allergic. *If maximum allergy exists, the exclusion of the allergenic foods should be complete. The time required to restore cellular structure and function varies with the degree of the causative allergies and the tissue reactions from those allergies.* Moreover, it is possible that food and other allergens remain in the blood and body tissues for days, or weeks, and possibly traces of them for months. The speed of their elimination or destruction undoubtedly varies in different patients Their persistence probably causes the recurrence or continuation of symptoms in certain patients for several weeks after the allergenic foods have been completely removed from the diet. The natural fluctuation in the degree of allergy and the well recognized refractoriness that arises after many allergic reactions could be the reason why the allergic symptoms from the residual allergens persist and vary in degree after the allergenic foods have been eliminated from the diet. These considerations emphasize the importance of holding a patient to the prescribed elimination diet for at least two or three weeks and often for longer periods.

CHAPTER V

THE ELIMINATION DIETS

The elimination diets include those foods which infrequently produce allergy. Because of the fallibility of the skin test (see page 13), diet trial is the most important diagnostic procedure which is available at the present time for the study of possible food allergy. The writer first proposed his elimination diets in 1926; in 1928 he published five such diets. The first four contained one or more cereal grains and excluded wheat, milk, egg, fish, chocolate, the cabbage group of vegetables, orange, apple, banana, melons, berries, nuts, spices, tea and coffee. The fifth diet consisted of milk only. *The frequency of allergy to the excluded foods had been determined by a history of possible food dislikes or idiosyncrasies and by positive skin reactions. The clinical importance of histories and skin reactions had been confirmed by the relief of symptoms with the exclusion of these foods, and by reproduction of symptoms with the subsequent addition of these foods.* The writer's continued experience and the recorded opinions of other allergists since the first publication of these diets have confirmed the relative frequency of allergy to those foods which are excluded from the elimination diets. The reasons for using these diets rather than a wheat-, milk- and egg-free diet have been stated on page 17.

For several years, continued experience has indicated desirable changes in the original elimination diets. In 1933, the diets were revised so that the first two contained one or more cereal grains and the third was cereal-free, and depended on tapioca, potato, and the legumes for its starches. This cereal-free diet has been of increasing value in practice. The fourth diet contained milk. Since then a few additional changes have proved of help (see page 143) Because of the frequency and severity of cottonseed allergy, cottonseed oil and shortening have been excluded. Sesame oil and soy oil and shortenings have been substituted in Diets 1 and 3 and Mazola oil has been used in Diets 1 and 2. All legumes have been excluded from Diets 1 and 2. White potato and tomato are included only in Diet 3. Because of the present war, sesame oil is becoming unavailable. In Diet 1, therefore, until the war is over, olive or Mazola oil is included and soy bean oil or possibly peanut oil must be used in Diet 3.

The elimination diets should be used as diagnostic tools for the study of possible food allergy. As such they are comparable to other diagnostic procedures, such as urinary tests for possible diabetes or nephritis or the *x*-ray examination of the lungs or the gastro-intestinal tract for assumed disease. The use of the elimination diets does not imply a priori that the physician has made a definite diagnosis of food allergy in the patient. In fact, they will often help to rule out food allergy as a cause of symptoms.

allergy may be present. The emphasis on food allergy in this and other chapters does not mean that the writer would ignore other types of sensitization.

NECESSITY OF DETAILED MENUS FOR ELIMINATION OR TRIAL DIETS

Because the patient often must remain on the elimination diet for longer periods than a few days in order that the possibilities of food allergy may be adequately studied, *the foods should be prescribed so that satisfying meals can be prepared and nutrition, above all else, is not damaged.* The writer's routine elimination diets and menus contain carbohydrates, meats, vegetables, fruits, sugar, oil, and salt which permit the preparation of regular meals containing soup, salad, meat, vegetables, bread, jelly or jam, dessert, and a beverage as shown in printed menus on pages 156 to 195.

When patients are told to exclude only positively reacting foods from the diet, satisfying meals often are impossible and nutrition is endangered unless the physician painstakingly writes out a detailed menu with foods allowed, and unless he assures himself that the patient's nutrition thereby is protected. The inclusion of varying amounts of forbidden foods in the patient's diet is difficult to prevent unless he is given such detailed menus for every list of foods which is ordered. Advice about eating away from home, as given on page 139 is also necessary. These are some of the disadvantages of the test-negative diet. Others are discussed on page 14.

To obviate the danger of malnutrition in the patients who are on the [illegible] physician, and if possible for the patient, to determine the approximate amounts of protein, calories, vitamins, and minerals actually eaten, and to increase or supplement any which are below the normal requirements for the age and weight of the patient (see page 204). The balancing of the diet has been discussed on page 140.

NECESSITY OF ABSOLUTE ELIMINATION OF EXCLUDED FOODS ESPECIALLY *DURING THE DIAGNOSTIC PERIOD*

While the possibility of food allergy is being studied, the patient must not eat or taste a trace of food which is not prescribed in his elimination diet. Only when the physician is certain that the patient coöperates fully in this respect can he make correct deductions regarding the effect of the diet. Above all else, the patient must not deceive himself and his physician during trial dieting by making conscious or unconscious mistakes, large or small, in his food intake

As has already been emphasized, *during the period of study of possible food allergy the physician must assume a maximum degree of allergy to all excluded and therefore suspected foods.* The necessity of the absolute exclusion of all eliminated foods therefore is self-

Unfortunately the idea has been written into the literature that food allergy can be excluded if the symptoms are not relieved by an elimination or test-negative diet in a few days. Such inadequate use of trial diet may be responsible for a diagnosis of psychoneurosis in patients who are afflicted with chronic food allergy, and accounts in part for the failure of some physicians to recognize the frequency of food allergy.

The time necessary to use elimination diets for the study of possible food allergy varies with the patient's problem. If daily or bi-weekly symptoms disappear during the first two weeks of dieting and similar relief has not occurred for several months before, then it can be assumed that the foods productive of allergy in the patient are absent from the diet. Foods, thereafter, can gradually be added as suggested on page 143.

When symptoms recur every two to four weeks, relief will have to be maintained for two or three months before adequate evidence is obtained that the allergenic foods have been removed.

When symptoms recur only for a day or so every two to six months, prolonged diet trial is not justifiable unless serious symptoms such as asthma or epilepsy warrant prolonged study. If the symptoms are highly suggestive of food allergy and are severe and invaliding, then the use of various elimination diets, as suggested on page 143, may be justified. Such diet trial should extend over a period of three to six months before the possible control of the symptoms by the elimination of allergenic foods should be abandoned. Such prolonged diet manipulation, of course, demands protection of nutrition and weight, as stressed on page 140. *Thus, the length of time the initial elimination diet should be used varies with the frequency with which the symptoms have recurred.*

After the symptoms are relieved, other foods must be added—one or two every week—as recommended on page 143. The fact that allergenic reactions from such foods may appear in a few hours or only after two or three weeks of inclusion in the diet, again must be emphasized Therefore the final determination of the degree and time of reactivity of such foods necessarily is a long procedure in certain patients, and demands absolute cooperation and much persistence and fortitude in both the patient and the physician. Prolonged diet manipulation is fully justified by the possible relief of chronic asthma, nasal allergy, eczema, long-standing gastro-intestinal symptoms, recurrent headache, migraine, or other allergic symptoms which often have been present for years, and perhaps since childhood. At all times, other possible influences on the symptoms, such as climate, seasons, nervousness, and the relief of diseased states other than allergy must be kept in mind in evaluating the possible rôle of food allergy. Moreover, *it must be stressed over and over again, that nutritional requirements must be adequately met by the diets prescribed.* If this is not possible according to the directions on page 151, elimination diets should be discontinued.

It must be emphasized that the patient suspected of or afflicted with allergy should be studied not only with the possibility of food allergy in mind, but also with the realization that all types of inhalant, bacterial, or contactant

allergy may be present. The emphasis on food allergy in this and other chapters does not mean that the writer would ignore other types of sensitization

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are relieved and separate foods gradually are added, tolerance for each allergenic food may be determined. It may be found that butter or oleomargarine is tolerated but not milk or cream; the yolk of egg but not the white; a small amount of wheat or rice, but not large amounts. Therefore, in the writer's opinion, relief of many patients from chronic or acute symptoms due to food allergy will be prevented if the advice of some students is followed to include during the initial period of study foods like butter, oleomargarine or melba toast, or if no provision is made for detailed menus and proper recipes so that not a trace of a forbidden food will be eaten.

To be certain that the necessity for strictness in dieting is understood, *the physician should interview the patient or communicate with him at frequent intervals*, at first every week or two. He should be sure that the patient is not tasting forbidden foods; that foods are cooked in clean utensils and served in clean dishes; that spices and condiments are not used unless specifically ordered; that the specified oils and shortenings are employed; that cooks in home, restaurant, or hotel are not making any of these mistakes and are not stirring or serving food with unwashed spoons or knives that have just been used in forbidden foods such as milk, soup, or custard. As stressed on page 140, the physician must be assured that bakery products are being made according to recipes furnished by him with specified flours, shortenings, sugars, and flavors in the home or by bakers. So-called soy, lima, rice, or potato bread as ordinarily baked usually contains wheat or gluten flours and often milk, egg, or cottonseed shortening. It is impossible to make a yeast-raised bread of these flours which is at all light without the addition of wheat or gluten flours. Thus, to be sure about such bakery products, the physician must be certain that pure and unadulterated soy, lima, or other flours are used. The physician or patient should watch the making of the bread, cake, or cookie by the cook or baker, to be sure that only these flours and other ingredients specified in the recipes and no trace of any other food are used in the process. He should watch the baking process even until the product is taken from the oven. He will then know the quality and texture which can be obtained by honest preparation. Similar products from the same baker probably can be depended upon.

Canned or prepared mixtures of foods such as soups, preserves, sauces, mayonnaise, catsups, sausages, are forbidden. Even though the ingredients are printed on the container or wrapper according to the new pure food law, it cannot be assured that all the ingredients have been included or that they have not been changed. If soups are used they should be eaten only in the patient's home where their contents can be accurately determined. Whether the use of corn glucose or of other forbidden sugar in jellies and preserves will cause allergy in a corn-sensitive individual is not certain, but nevertheless these sugars should be excluded from the diet until they have been added by the physician. Similar critical analysis of all other foods and of their preparation is necessary.

Most patients must be told on several occasions and perhaps repeatedly

for several months or even years, that *strict adherence to the diet is necessary if the symptoms which arise from severe food allergies are to be eliminated.* Patients and their associates will argue that "a little will do no harm" or that a certain recipe contains no butter, milk, egg, wheat, or other forbidden food; but, unfortunately, it is the occasional taste of these foods, often in small amounts, that keeps the allergy active and prevents symptomatic relief. Such small amounts of food, moreover, can do no possible good except give transient gratification and relaxation from the will power required to maintain the strict diet. The few calories and the other nutritional elements gained are not worthy of consideration. Thus, contrary to the usual statement, "this small amount" of bread, dessert, cookie, butter, milk or cream may do great harm and often is responsible for the failure to obtain relief so important for the patient. It is obvious that all knives, forks, spoons, pans and plates must be washed free of forbidden foods (see page 151).

It is again emphasized that this strictness and absolute exclusion of eliminated foods is necessary during the diagnostic period of study of possible food allergy. After relief of symptoms and the tolerance for the [illegible] *food has been determined, tr* [illegible] *may be tolerated.* Often, h [illegible] only with the total exclusi [illegible] especially during the fall-to-spring months.

MEALS AWAY FROM HOME OR IN HOTELS OR RESTAURANTS

Eating away from home in friends' houses, in restaurants, in hotels or on trains always is difficult for one who must be exact with a diet. *Since even the occasional taste of a forbidden food may prevent the disappearance of allergic symptoms, it is most im* [illegible] *diet trial to* [illegible] *ents of whic* [illegible] two later t [illegible] lasting for several hours. The taste or small amount of a food that "will do no harm" may delay good results for one to three weeks, as noted on page 137. Suggested menus for the cereal and cereal-free elimination diets obtainable away from home are printed on pages 172-176 If eating in restaurants, hotels, or boarding houses is constantly necessary, a cooperative and understanding cook usually can be found who will prepare the meals according to the specific menus and recipes provided by the patient.

In brief, *away from home a patient can safely take the following foods:* plain salads containing the vegetables on the diet. The salad dressing may consist of lemon or vinegar [illegible] oil should be used. [illegible] or other allowed oil [illegible] meat. Plain meat, such as chops, steak, or cold or hot roast beef or lamb may be obtained practically anywhere. It should be broiled or fried in its own fat. No butter or other fat or pepper should be used. Roast meats should be served plain with no gravies or sauces, since these invariably contain butter,

flour, spices or flavors. Baked or boiled potatoes, white or sweet, served in their jackets can always be obtained. If necessary, the patient should wait in the restaurant while they are being cooked. Fried, mashed, or scalloped potatoes are forbidden unless the foods used in their preparation, such as milk, butter or wheat flour, are allowed. The plain vegetables as well as the canned or possibly fresh fruit which are allowed on the diet may be eaten. Such a meal can be obtained at almost any hotel and restaurant, or in the home of an understanding and coöperative friend, if the patient orders specifically and insists on accuracy of preparation. No bread or bakery products should be taken: If Ry-Krisp has been added, it may be eaten. No butter, unless it has been added to the diet, should be eaten. The patient may carry a few slices of his bread or cookies made at home or by the entrusted baker (see page 140) in his pocket to use at meals away from home. On prolonged trips these bakery products may be mailed at proper intervals. Detailed menus for meals away from home are presented on pages 173 to 176.

During the period of diagnostic diet trial such meticulous care is necessary if dependable conclusions regarding the effect of the diet are to be drawn. With a similar attitude and equal care, the foods in other elimination diets usually can be obtained away from home. If maintenance of weight is a problem, the inclusion of adequate calories in the meals according to suggestions on page 154, is imperative. Nutrition must be maintained as emphasized on page 140. If undesirable weight loss or nutritional impairment occurs, the elimination diet should be discontinued until a readjustment of dieting has assured their prevention.

After the rôle of food allergy has been determined and the tolerance for allergenic foods has been ascertained, partial or complete exclusion of those foods may be required.

MAINTENANCE OF NUTRITION

As stressed throughout this book, *nutrition must be maintained at all times while elimination diets are being given.* When egg and milk products are excluded, the *maintenance of adequate protein intake* requires the eating of a considerable amount of the specified meat at least twice a day. Bacon also may be taken. Canadian bacon may be preferable to the usual kind because of its higher protein content. Legumes add considerably to the protein content. Soy bean especially is desirable because of its content of all the amino acids which are essential for the protein synthesis in man. The approximate vitamin content of the foods in the diet can be estimated by referring to published tables (see page 201). *If any of the vitamins is deficient,* additional amounts of vitamin A, B, C, D or E should be ordered. If vitamin A is deficient, Caritol, preferably in sesame oil or in corn oil, if corn is on the diet, may be given. Unless fish is prescribed, cod-liver or other fish oils should not be used. Thiamin and the vitamin B complex may be given if the diet is low in these vitamins. Preparations containing wheat germ or rice polishings are contraindicated unless these foods have been added to the diet. Cevitamic acid

in from 50 to 100 mg. amounts should be taken if allergy to citrus fruits exists. Many of the vegetables and fruits contain considerable amounts of vitamin C. Allergy to vitamin C and the use of vegetables when it occurs are discussed on page 146. The regular elimination diets are deficient in vitamin D. Therefore, if exposure to the sun is not possible and a sun lamp is not available, Viosterol, preferably in sesame oil, or Drisdol should be given. If fish is allowed in the diet, the vitamin D-rich fish oils or their concentrates may be used.

The elimination of milk usually results in a *deficiency of calcium in the diet.* Sherman recommended that 1 gm. of available calcium daily be contained in the diet. Each quart of milk contains about 1.2 gm. of calcium The amount of calcium in each menu of the elimination diets in this chapter has been estimated. The additional amount necessary to meet the daily requirement of 1 gm. should be given in the form of one of the calcium salts Calcium carbonate is the cheapest source; 40 per cent of its weight is available calcium One teaspoonful* weighs about 2.2 gm. and contains 0 88 gm. of available calcium. Dicalcium phosphate contains 24 per cent calcium; one teaspoonful weighs 3.5 gm. and contains 0 8 gm of calcium and 0 6 gm. of phosphorus. Because of its *phosphorus* content, this salt is indicated especially in infancy when milk- and meat-free diets are prescribed. Calcium gluconate is the most soluble salt but contains only 9 per cent available calcium; one teaspoonful weighs 2 gm. and contains only 0.18 gm. of calcium. The writer routinely prescribes calcium carbonate in doses of ½ to 1 teaspoonful when milk is excluded from the diet. In infancy when meat and milk have not been added ...

... children and at ... adults dislike it. If sugar and a trace of vanilla are added to the watery suspension of the ... When soy bean is in...

When anem... additional iron may be required. However, allergy to all iron preparations may occur.

With diet tables, the approximate amounts of protein, carbohydrate, fat, calories, calcium, phosphorus, and iron have been calculated for the menus specified for Diets 1 and 2 and for the cereal-free diets (see pages 156 to 196). The approximate amounts of vitamins A, B, C, D and G should be determined by the use of the values in published tables (see page 201) Additional calcium and vitamins must be taken ... the requirements ... requirements of th... ments for various ...

* One teaspoonful is the amount in a level, moderately packed standard measuring teaspoon

MAINTENANCE AND INCREASE OF WEIGHT

When the diet contains the number of calories required for the patient's age and satisfies the nutritional requirements, then the weight should either increase or should be maintained. *If loss of weight occurs, more of the calorie-carrying foods*, namely the carbohydrates, sugars, and fats, should be taken. Specific directions for an increase of these foods are detailed on page 154. If weight loss occurs in spite of the intake of additional food, *the physician must ascertain whether or not a disease other than allergy is present.* The general health of the patient, as well as his allergic problem, must always be under control. *Weight loss may be due to impaired digestive function.* If so, it may increase when dilute hydrochloric acid, pepsin, or pancreatic ferments are given. While the diet is continued, the weight should be recorded every two or three days so that undue loss can be forestalled.

The gradual increase in weight and height which is desirable in childhood and youth may not occur for several weeks or for a few months after the diet has been instituted even though adequate calories are taken. Weight increase occurs at definite intervals in children and stationary at other periods.

Uncontrolled allergy, especially to foods, often accounts for lack of appetite and leads to undernutrition, as noted on page 131. Children who have been spoon-fed all their lives often develop good or ravenous appetites when the allergenic foods are eliminated.

INCREASED TOLERANCE OR HYPOSENSITIZATION IN FOOD ALLERGY

Food sensitizations in some patients tend to diminish or disappear as the foods are eliminated from the diet. At times, their elimination for one or two months reduces the allergic tissue reactivity so that they can be eaten without causing the previous symptoms. At times, such foods must be omitted entirely from the diet for six to twelve months or for several years before tolerance returns. Vaughan concluded that on the average a food must be excluded for four and one-half years before it can be eaten without causing obvious allergic symptoms. Often food allergy persists for many years even though causative foods are excluded from the diet. In childhood food sensitizations have a tendency to disappear gradually. The same holds true at times during the late forties and fifties. The symptoms due to allergy may gradually diminish, but the potential allergy usually persists and, in a short time or even years later, other allergic symptoms may develop from the same foods. Thus, infantile eczema may disappear and asthma may arise in the second or third year; gastro-intestinal allergy in childhood may be supplanted by recurrent sick headaches or migraine in adolescence.

The diminution of food allergy by hyposensitization with gradually increasing doses of the allergens of the causative foods has failed except in rare cases. In many instances patients are so sensitive to food allergens

that an infinitesimal dose such as 0.10 cc. of a 1 to 1,000,000 dilution of the allergen will reproduce the symptoms. Occasionally gradually increasing doses apparently are tolerated and finally foods can be taken without symptoms (see page 57).

The attempt *to increase tolerance to definitely allergenic foods by increasing doses of such foods by mouth* has failed in the hands of most allergists. The good results which apparently arise are often obtained with foods which mistakenly have been adjudged allergic by the patient or physician, perhaps because of a positive skin reaction. However, Black recently has reported good results from oral therapy which warrants its continued clinical trial.

Thus, food allergy can best be decreased by the elimination of the allergenic food from the diet. The more complete the elimination the greater the possibility that tolerance will be established. Because of the necessity of eliminating allergenic foods for varying periods of time, often for many years the physician and patient must be absolutely assured that the elimination diet required for the relief of the patient's symptoms is balanced adequately to protect nutrition and weight, as discussed on page 140.

CHOICE AND USE OF THE ELIMINATION DIETS*

During the last few years, the cereal-free elimination Diet 1, 2 and 3 has been used in preference to the diets which contain cereal grains since group sensitizations to two or more cereal grains often exist, especially if wheat allergy is present. In the initial cereal-free diet all the meats, vegetables, and fruits in the routine elimination Diets 1, 2, and 3 as well as soy, lima, potato, and tapioca as sources of ...

... the initial diet contains rice, corn, or rye, a combination menu of Diets 1 and 2 is used. Thus, *two elimination diets are being used for the initial study of the patients in whom food allergy is suspected. The cereal-free 1, 2 and 3 diet is preferred. When intolerance for legumes is indicated by history, skin testing, or distress after eating,* the combined Elimination Diet 1 and 2, or Diets 1 or 2 individually are also available. The menus are published later in this chapter.

The initial diet may be modified as follows: If there is a definite history of aversion or intolerance, or a definite positive skin reaction by the scratch test to any foods, these foods ...

... as discussed on page 13. ... foods of similar caloric, vitamin, and protein content may be added if the deletion of the foods suspected as being allergenic impairs the menus.

* Printed copies of the various Elimination Diets with their menus and ... be purchased from J. W. Stacey, Inc. ...

If relief occurs after the cereal-free 1, 2 and 3 diet has been used for an adequate period, as discussed on page 135, rice and corn and later rye may be added. Possible ways in which these cereals may be added are detailed on page 200. If, on the other hand, the cereal-containing Diets 1 and 2 has been initially used and has given relief, then legumes, including peas, string beans, lima beans and soy beans, may be added if allergy or digestive intolerance to them is not suspected, according to the suggestions detailed in the menus on page 156.

As relief continues, the following foods, one or two at a time, may be added at one- to two-week intervals. The varying degree and possible time of reactions from them are discussed on page 54. The influence of seasons and of proximity to the ocean must be kept in mind (see page 56). Cherries, figs, avocado, cranberry, rhubarb, celery, eggplant, cauliflower, cabbage, sprouts, broccoli, banana, apple, orange, melons, ham, pork, fin and shell fish, rabbit, duck, and game birds may be added to the diet individually. Unusual foods, such as taro, papaya and other tropical foods may be tested one at a time. The time for the trial of egg, milk and its products, and wheat depends on the patient's history and the judgment of the physician. If definite evidence of allergy to any of these common foods exists, it may be unwise to add them to the diet until the symptoms have been absent for several months, during which time tolerance may have been restored. Since the food allergens and the tissue reactions may persist in the body for several weeks or longer, as noted on page 135, a food which has been a definite cause of allergy should not be added too soon after relief has been obtained.

The addition of various beverages needs discussion. In the initial diet, coffee should be excluded because it frequently causes allergy. It may be tried soon after definite relief has occurred. The fact that egg often is added to clear coffee and that chicory, to which occasional allergy is present, is contained in some grinds, must be remembered. Allergy to tea is less frequent Nevertheless, it is excluded from the initial diet. It may be added as symptomatic relief becomes definite Brazilian tea or maté, to which allergy is unlikely in this country, may be an agreeable substitute; it is a good vehicle for sugar. The autonomic nervous system of many allergic patients is very sensitive and therefore the elimination of coffee and tea is beneficial because of their caffein content.

In the initial diet, the specified fruit and tomato juices are included. Excessive amounts, however, may cause digestive disturbances, including diarrhea, and decrease the appetite. The possible inclusion of corn glucose in certain canned juices and of spices in some tomato juice must be remembered, especially if such foods have not been added to the diet. The use of soy bean substitutes for milk in the presence of allergy to cow's milk will be discussed on page 182. A moderately thick purée of split peas, salted, and flavored with a little bacon or ham shank and served hot or cold, makes a fair substitute for milk It may be given to young children as a drink or a soup and may be acceptable to older children and even adults. Canned pea soups should not be taken because

Graphic Record of Manipulation of Elimination Diets

Date	1/10					
Rice		2/10	0	3/15	0	
Corn		2/24				
Tapioca	✓					
Rye						
Oats						
Wheat			4/1	0	5/15	0
Lamb	✓					
Chicken	✓					
Bacon				4/23		
Beef	✓					
Turkey					9/1	
Salmon		3/2				
Halibut		3/2				
Cod		3/2				

	1/10					
Lettuce						
Spinach	✓					
Carrot	✓					
Squash			7/15	0		
Asparagus	✓					
Pea	✓					
Artichoke	✓					
Tomato	✓					
Beet	✓					
String Bean	✓					
Soy Bean	✓					
Lima Bean	✓					
White Potato	✓					
Sweet Potato	✓		0	3/2		
Green Pepper			4/15			
Eggplant			4/15			
Cauliflower			9/1			
Broccoli			9/8			

	1/10					
Lemon	✓					
Pear	✓					
Peach	✓					
Pineapple						
Apricot	✓					
Prune	✓					
Plum	✓					
Grapefruit	✓					
Orange		1/20				
Apple		2/17				
Banana		4/15				
Cantaloupe		8/1	0			
Watermelon		8/1	0			
Grape		9/1	0			

	1/10					
Sugar	✓					
Maple Syrup	✓					
Sesame Oil	✓					
Soy Oil	✓					
Mazola Oil						
Olive Oil		5/1				
Olive		5/1				
Salt	✓					
Pepper		7/1				
Egg		2/1				
Milk		6/1	0			
Butter		6/1	0			
Cream		6/1	0			
Tea	✓					
Coffee			3/24			

Comment. Woman, aged thirty-two years, with perennial nasal allergy for twenty years, exaggerated in the last three years especially in winter months. Distention, belching and epigastric burning also present for several years, aggravated in patient's opinion by bread, bacon, squash, pineapple and melons. On January 10, cereal-free elimination diet minus bacon, squash, pineapple and melons plus tea was ordered. Subsequent dates indicate additions of other foods. Zeros indicate elimination of foods because of reproduction of nasal or abdominal symptoms. With this type of record the diet on any date with a record of former diet trials can be easily ascertained. Orange, egg, fish and apple were added in the first few weeks after initial relief since no history suggestive of allergy to them existed. Diet trial determined intolerances to rice, wheat, squash, melons and milk.

of their varying content of other foods and spices. Plain purée of peas is allowable. Purée of soy bean (see page 76), however, is more desirable since its protein contains essential amino acids which are present in animal proteins but are not found in other legumes.

The graphic record of the foods first ordered for the patient and of subsequent additions and subtractions is easily kept on the form as printed on page 145.

Fruit-free Elimination Diets.—*Allergy to individual fruits or to a limited number of biologically related or non-related fruits frequently is encountered.* Therefore those fruits to which allergy most often arises, such as orange, apple, banana, berries and melons, are excluded from the first three routine elimination diets discussed in the preceding section.

In the last few years, *the writer has encountered a group of patients who apparently are allergic to almost all fruits.* Allergy to other foods, especially to those excluded from the routine elimination diets, usually accompanies fruit allergy. Therefore, when extensive fruit allergies are suspected the patient should be placed on a Fruit-free Elimination Diet. Menus for such diets, both cereal-free and with cereals (Diets 1 and 2) are detailed on pages 168 to 170. When marked fruit allergy is present, sensitization to flavors and condiments also must be suspected. For this reason flavors of all types in gum, candies and the like, except vanilla and maple, are excluded from the diets. After relief has been obtained individual flavors may be given to determine their allergenic effects on the symptom-free patient.

Probable allergy to cevitamic acid has occurred in some of our fruit-sensitive patients especially when allergy to citrus fruits existed. If the latter occurs, vegetables, such as tomato, cauliflower, cabbage, broccoli, spinach, watercress and green peppers which contain relatively large amounts of vitamin C, should be included according to the patient's allergic tolerance for them. Proper canning of these foods causes a moderate loss of vitamin C according to published tables (see page 201). Before making a final decision about allergy to vitamin C its effect should be tested two or three times in the symptom-free patient.

Fruit allergy may be so intense that the slightest trace of the allergenic fruit will produce definite symptoms which will persist decreasingly for from two to seven days. Thus, the lemon in one small piece of candy and the wintergreen or fruit flavor in one piece of gum may produce great distress in highly allergic patients.

Fruit-free elimination diets are used in most cases of urticaria and angioneurotic edema, in many cases of possible gastro-intestinal and bladder allergy, in cases of possible allergic toxemia and in other cases of food allergy in which fruit allergy might be a factor. The occurrence of fruit allergy in joint allergies and in rheumatoid arthritis has been discussed on page 128.

When these elimination diets are prescribed protection of nutrition and maintenance of a proper weight must be assured. Further discussion of the indications for the use of the fruit-free diet will be found throughout Chapter IV and on pages 115 and 168.

SUPPLEMENTAL ELIMINATION DIETS

When the regular Diets 1, 2, or 3 fail to relieve the symptoms and definite indications of food allergy persists, the supplemental elimination diets may be required. Such diets may be used initially if sensitizations to many different foods or to nearly all members of one or more groups of foods, such as cereals, fruits, vegetables, or meats are indicated by history or by skin reactions. Sometimes, allergy to biologically related vegetables or fruits such as legumes, citrus or pit fruits exists or may be suspected.

Thus, in case of possible food allergy, *all foods must be suspected and minimal trial diets may be arranged containing the following foods:*

1. A choice of one or two of the following carbohydrates: rice, corn, tapioca, sago, taro, sweet potato or white potato.
2. A choice of one or two of the following protein-rich foods: lamb, beef, chicken, soy bean, nutramigen.
3. A choice of two or three of the following vegetables: spinach, carrot, beet, artichoke, asparagus, pea, string bean, tomato.
4. A choice of one or two of the following fruits: lemon, grapefruit, pear, peach, apricot, pineapple.
5. Mazola (corn), olive or sesame oil, white sugar, maple syrup or corn glucose, salt.
6. Tea, maté (Brazilian tea) or the juice of tomato or any fruit included in the diet.

(a) *If allergy to all foods in any group is not suspected*, a diet containing foods chosen from the above six groups can be tried, as follows: one or two starches, one or two protein foods, two or three vegetables, one or two fruits, one oil, sugar or glucose, tea or maté, salt.

If relief is not evident in two or three weeks, a similar diet containing different foods may be advisable.

(b) *If allergy to all fruits is suspected*, the fruit-free elimination diets (see pages 168 to 172) may be used

(c) *If allergy to all or most vegetables and fruits needs study*, an elimination diet containing one or two carbohydrate foods, one or two [illegible]
and sugar [illegible]
or boil [illegible]
flavor [illegible]
three [illegible] necessary to maintain weight. Or beef, rice (plain or cooked with sugar and salt with or without vanilla or caramel flavor), maté and sugar may be ordered. As with all fruit-free diets, vitamin C in 100 to 200 mg doses a day must be given. The use of calcium and other vitamins is discussed on page 140.

If definite relief occurs, an additional starch and meat and later individual vegetables may be added every three or four days, omitting any that cause difficulty. Fruits and other foods may be tried later. Allergy to most vegetables and to most or all fruits occasionally occurs.

(d) *If allergy to all mammalian meats is suspected*, cow's milk may be ordered as the source of protein providing probable milk allergy is not

present. The use of denaturized cow's milk or of goat's milk is discussed on page 58.

If allergy to milk and mammalian meats is suspected, one or two fowls or fishes may be tried as a source of protein. Frog's legs may be used.

(e) *If allergy to all animal foods is possible*, the following sources of protein may be utilized.

(1) *Soy bean and other legumes* in various cooked forms may supply protein. Since soy bean contains all amino acids essential for human nutrition, comparatively large amounts should be used. It can be given to infants and children in soy milk (see page 183) or as a purée prepared from home cooked (best in a pressure cooker) or from canned beans. In adults, both soy milk and beans as such or puréed can be taken. Cookies containing only soy flour can be made (see page 134). If potato starch, corn starch, or rice flour are allowed, other bakery products can be prepared (see page 233). Split peas or lima beans as such or puréed or fresh cooked peas or beans are allowable.

(2) *Nutramigen* contains all amino acids essential for human nutrition with dextro-maltose, corn oil, salt, arrowroot starch, calcium, potassium, and phosphorus compounds. With water, an adequate substitute for cow's milk results. A thicker preparation can be taken as a soup. Though the amino acids are derived from the enzymatic hydrolysis of casein, active milk allergens have not been demonstrated by the production of symptoms with its ingestion by milk sensitive patients. Its taste is not objectionable to infants but may be to adults and especially children. In sufficient amounts, weight and nitrogen balance can be maintained in infants. In older children and adults, a starch cooked with sugar should be used Nutramigen may also replace animal proteins in regular elimination diets

(3) In infants or young children, *fresh or canned human milk* may be available as a substitute for other animal proteins or legumes in the elimination diet.

(4) *Almond milk* (see page 199) may be used as the source of protein provided nutrition is maintained with other foods in the elimination diet and with proper vitamins and minerals

If any of the above diets is prescribed *the physician's constant supervision is imperative.* Detailed menus must be prepared so that the patient will know what to eat at each meal. Identical amounts of the same foods must be taken three times a day with those diets containing a very few foods. Nutritional requirements may even demand four meals a day during diet trial. The monotony of the diet is justified by the possibility of relief from chronic and often invaliding symptoms.

The *length of time* necessary for diet trial is the same as for the regular elimination diets (see page 135). *Weight maintenance and protection of nutrition* (see pages 140 and 142) are of special importance with restricted diets while possible food allergy is being studied and with the continued exclusion of important foods necessary to prevent a return of symptoms.

ORDERING OF ELIMINATION DIETS BY THE PHYSICIAN

According to the physician's written or verbal order, his nurse or assistant can be easily trained to provide *the office patient* with the important detailed menus which follow in this chapter and to impart the instructions necessary for their proper and accurate use (see page 151). *In the hospital or clinic*, the physician may write his order on the chart and the dietitian may prepare the meals accurately according to the menus and directions for the specified elimination diet. The physician may also indicate the desired number of calories. He, of course, must be sure that his office assistants and the hospital or clinic dietitians have the menus for the elimination diets available and that they understand that accuracy is required in the preparation of the meals. The menus may be varied from day to day and made as pleasing and interesting as possible to the patient. This may be accomplished with the use of the various recipes in the appendix of this volume. For bakery products, pure unadulterated flours must be used. If such products are purchased, they must be made by honest bakers supervised by the physician (see page 138).

Orders for various elimination diets may be written by the physician in office or hospital as follows:

[illegible]

[illegible] 1, 2, and 3.

[illegible] ...nts (specifying foods to be included).

Reducing Cereal-free Elimination Diet (750 calories).

These simple orders not only call for a specific list of relatively nonallergenic foods but also for detailed menus with recipes.

If the patient's history or definite skin reactions have indicated probable allergy to certain foods in the elimination diet, orders may be written as follows:

Cereal-free Elimination Diet 1, 2, and 3, minus bacon, white potato, spinach and peach; [illegible]

Fr [illegible]
and [illegible]

If [illegible]
and [illegible]), and the symptoms suggest possible food allergy as a cause, then supplemental diets (see page 147) may be ordered. Such diets, for example, may contain: Tapioca, lamb, white potato, tomato, squash, sugar, sesame oil, salt; or rice, soy bean, peas, string beans, lima beans, spinach, beets, soy bean oil, sugar, salt.

When limited diets such as these are ordered for office patients, individualized menus and possibly recipes must be given. If they are ordered in the hospital, the dietitian must use the prescribed foods so that three palatable meals are served. Vitamin and calcium therapy, as suggested on page 140, must be given Protein metabolism must be protected with a sufficient amount of protein-containing food. Furthermore enough calories to maintain a satisfactory weight level must be provided. *If*

protection of nutrition and maintenance of a proper weight is not possible, the supplemental diets should be discontinued.

Elimination Diets (Rowe)
(Second Revision)

Diet 1	*Diet 2*	*Diet 3*	*Diet 4*
Rice	Corn	Tapioca	Milk*
Tapioca	Rye	White potato	Tapioca
Rice biscuit	Corn pone	Breads made of any combination of soy, lima and potato starch and tapioca flours	Cane suga
Rice bread	Corn-rye muffin		
	Rye bread		
	Ry-Krisp		
Lettuce	Beets	Tomato	
Chard	Squash	Carrot	
Spinach	Asparagus	Lima beans	
Carrot	Artichoke	String beans	
Sweet potato or yam		Peas	
Lamb	Chicken (no hens)	Beef	
	Bacon	Bacon	
Lemon	Pineapple	Lemon	
Grapefruit	Peach	Grapefruit	
Pears	Apricot	Peach	
	Prune	Apricot	
Cane sugar	Cane or beet sugar	Cane sugar	
Sesame oil†	Mazola oil	Sesame oil†	
Olive oil‡	Sesame oil	Soy bean oil	
Salt	Salt	Gelatin, plain or flavored with lime or lemon	
Gelatin, plain or flavored with lime or lemon	Gelatin, plain or flavored with pineapple	Salt	
Maple syrup or syrup made with cane sugar flavored with maple	Karo corn syrup	Maple syrup or syrup made with cane sugar flavored with maple	
	White vinegar		
	Royal baking powder		
Royal baking powder	Baking soda	Royal baking powder	
	Cream of tartar		
Baking soda	Vanilla extract	Baking soda	
Cream of tartar		Cream of tartar	
Vanilla extract		Vanilla extract	
Lemon extract		Lemon extract	

* Milk should be taken up to two or three quarts a day. Plain cottage cheese and cream may be used. Tapioca cooked with milk and milk sugar may be taken.

† Difficult to obtain during this war.

‡ Allergy to it may occur with or without allergy to olive pollen. Mazola oil may be used if corn allergy is not present.

USE OF ELIMINATION DIETS
(Important to Read and Follow)

Since skin tests often are negative to allergenic foods and since intradermal tests often give negative or false positive reactions which are not associated with clinical allergy, test negative diets usually fail to control the symptoms due to food allergy. Therefore trial diet with elimination diets is indicated for the study of possible food allergy (see page 143).

1. Foods productive of possible allergy as suggested by history or skin reactions may be omitted and similar foods may be substituted (see page 145).

2 No drop or trace of any food not ordered or included in the diet should be taken during the initial study of possible food allergy. Clean utensils and dishes free from traces of forbidden foods must be used. Spoons and knives must not be used unless they are washed free of all excluded foods, such as milk, egg, and wheat. Tasting of any food that is not on the diet is forbidden.

3. To increase caloric intake, 1 to 1½ ounces of prescribed oil should be served in a pitcher with each meal, to be used on salads and vegetables as tolerated; the remainder may be taken between meals if weight increase is important. Plenty of the prescribed sugar, syrup, jam, jelly, potato, bread, peas, beans, and tapioca taken with meals and between meals will increase the calories. Frequent weighing on the same scale will indicate whether or not caloric intake is adequate (see page 142). Prescribed meats must be taken twice daily to assure adequate protein and essential amino-acid intake. They must be cooked in their own fats or with prescribed oils or fats with salt but without pepper, condiments, or garnishes. Bacon for breakfast is to be taken if tolerated. Gravies must be made with meat juices, salted, thickened with prescribed flours, but should not contain condiments, onion, etc. Bakery products must be made according to the recipes in this volume by honest bakers or at home

4 Approximate vitamin content of the daily diet should be determined by use of the published tables. Vitamin A as Caritol and vitamin D as Viosterol should be ordered in sesame or other oil allowed in the diet. Drisdol also may be used to supply vitamin D. Fish oils are contraindicated until fish is added to the diet. Vitamin B_1 should be given as thiamin. B-complex capsules containing thiamin and the other synthetic B vitamins may be used. Calcium gluconate—2 teaspoonfuls twice daily, dicalcium phosphate—1 teaspoonful daily, or calcium carbonate—1 level teaspoonful, stirred in water, once a day mixed with foods or mixed with water and taken on an empty stomach will assure calcium balance.

5. Sesame oil (Globe A-1 or other reliable brands) is preferred, but difficult to obtain because of the war. Pure soy bean oil may be used. Olive oil often is adulterated, even when it is labeled pure. Allergy to olive at times occurs Cottonseed allergy is so frequent that cotton-

seed products are not used *in the initial diet.* A butter substitute, Sesame Spread, made of hydrogenated sesame oil, salted to taste, with artificial color and butter flavor will not be available during the war. Its use is optional. Specific oils or fats, and lards of specific fats must be used for shortenings and for greasing utensils.

6. The diet should be taken with rigorous accuracy for two or more weeks (see page 135). When definite relief of symptoms occurs which is longer than former periods of relief, additional foods listed in the other elimination diets may be added, one every five to seven days, and their effects carefully ascertained (see page 142). Detailed directions for addition of rice and corn to the cereal-free diet are given on page 200. Thereafter, other vegetables, fruits, meats, fowl, fish, spices, and nuts may gradually be added. In one to three months, milk, egg and wheat may be tried separately, one of them every two weeks. If the patient is allergic to any food, symptoms may occur immediately or within several days or even weeks according to the patient's tolerance. Such food should be eliminated. Later the patient's tolerance for each allergenic food can be determined and the necessity of continued partial or total exclusion of the food can be decided.

7. Since allergy to tea is infrequent it may be added to the original diet or as soon as relief of symptoms occurs. Maté (Brazilian tea) may be ordered if allergy to tea is likely. Coffee can be tried after relief of symptoms is assured. Various Cola drinks can be added only after more important foods have been added.

8. Increased tolerance arising from the elimination of a food may require weeks, months, or years. Hyposensitization with ingested or injected food allergens usually fails.

Inhalant, bacterial and contactant allergies often accompany food sensitizations. Their recognition and proper control are important and may be required along with the control of food allergy if the symptoms due to food and other allergens are not relieved. The physician must supervise the patient who is on the elimination diet by frequent conferences or letters. Proper weight and nutrition must be maintained.

WAR TIME EFFECTS ON THE ELIMINATION DIETS

I. Increasingly during the war, various foods in the Elimination Diets may be difficult to obtain. This is due to food rationing, to restricted production, or food processing, or to the lack of importations.

Tapioca especially has become unavailable in many areas. A considerable amount remains frozen by the government for use in the adhesive on the backs of bonds and stamps. When weight reduction is desired, tapioca can be omitted entirely. If maintenance or increase of weight is necessary, white or sweet potato may be eaten three times a day, or it may be necessary to assume the absence of allergy to rice, corn, or rye, and to use Elimination Diets 1 and 2 for initial diet trial.

Potato starch flour is becoming scarce. If it is not available in bulk,

such packaged flour as Swan Potato Starch Flour (Stein, Hall Mfg. Co., Chicago) may be obtainable. Potato starch is necessary to make good bakery products for cereal-free Elimination Diets. If weight increase is not a problem, such bakery products may be omitted and more potato and various prescribed legumes, may be used. If bakery products however are important, then the possibility of an absent or mild allergy to corn or rice may be assumed, and cornstarch or rice flour may be substituted for potato starch in the recipes (see page 233). Cornstarch is preferable because of the better resultant products. If symptoms are not relieved and rice or corn allergy is possible, a soy wafer and cookie (page 234) may replace the soy corn or soy rice bakery products so that a cereal-free diet becomes possible for diet trial.

Rice flour may become scarce because of its restricted manufacture. Then cornstarch or potato starch if available must be used as a substitute.

Since sesame oil is disappearing from the market, soy oil may have to be used exclusively in the cereal-free diets. Until the war is over the butter substitute, sesame spread, made from the hydrogenated oil will be off the market. If allergy to olive or peanut is unlikely, their oils also may be utilized.

II. The nutritional requirements of patients on elimination diets may require extra points for the following foods. The request for such extra foods must be made on a special form obtained from the rationing board filled in and signed by the physician.

1. If weight maintenance or increase is necessary (see page 154), calories can be increased by extra sugar. An extra 1 to 3 pounds each week may be ordered by the physician.

2. Plenty of specified oil also increases the caloric intake. This justifies the ordering of an extra one to three ounces a day for certain patients.

3 Meat is important (see page 140) when other animal proteins are excluded from the Elimination Diets. Thus it is justifiable for the physician to request 1 to 4 pounds of extra meat each week according to the age and activity of the patient. If mammalian meat becomes [illegible] at times [illegible] goose [illegible] the r[illegible] not obtainable.

4. When fresh vegetables are not obtainable, extra amounts of canned or frozen vegetables in the prescribed diet may be ordered through the rationing board. When fresh specified fruits are not in the market, extra points for canned or frozen fruits must be obtained Assurance of an adequate intake of vitamin C either in fruits or vegetables or in the synthetic vitamin is imperative.

5. White potato is scarce in certain areas and as the war continues it may be rationed. If so, extra amounts probably will be available upon the physician's special order. If it becomes unavailable and weight requires a liberal intake of starch, then rice or corn must be used even though allergy to one or both is suspected or actually exists. If tapioca

becomes available, possibly through the physician's order, extra amounts of it may suffice until potato again is obtainable.

During the war various foods may be used as substitutes for usual ones or used as "extenders" in commercial bakery or canned or other products. Thus cottonseed and peanut flours already have been used with wheat flour in some instances. Adulteration of salad oils may become common. All such possibilities must be remembered when elimination diets are used.

The menus and recipes for the elimination diets have been modified with the above effects of the war in mind. Other temporary or slight alterations in the menus may be necessary especially if the war is prolonged.

MAINTENANCE OF WEIGHT

The elimination diets require a change in eating habits. If it is important to maintain or increase weight, the physician must tell the patient to take adequate amounts of the starches, bakery products, sugar, jams and jellies, and oils, according to the prescribed diet, so that adequate calories will be ingested.

It is wise to give the patient a copy of the following discussion so that the patient can prevent undesirable weight loss.

The Maintaining or Increasing of Weight.—1. You should weigh every other day, and if undesirable weight loss occurs, more of the foods in the diet which are rich in calories should be taken.

2. You should take plenty of the specified oils on salads and vegetables. In addition, 1 to 6 teaspoonfuls of such oil may be taken after every meal. This amount varies according to your age and your ability to digest the oil.

3. You should eat plenty of the bread, cookies, muffins, and other bakery products made according to the special recipes or prepared by bakers supervised by your physician. More of these can be taken if plenty of jam, jelly, and maple syrup are used on them.

4. A butter substitute made of a prescribed fat such as sesame oil (see page 152) entirely free of milk products may be used in good amounts. (This is not available during the war.)

5. Plenty of jam and jelly made of the fruits in the diet should be used on the breads and cookies.

6. Plenty of sugar should be used in fruit drinks and in desserts. Tapioca should be cooked with specified fruit and plenty of sugar.

7. Log Cabin or plain maple syrup may also be used on any foods in your diet in order to increase your caloric intake.

8. When cereals are allowed, these can be taken with fruit juices, sugar, maple syrup, or caramelized sugar.

9. If you are on a cereal-free diet, you should take plenty of tapioca cooked with specified fruits and plenty of sugar. This may be eaten between meals and on retiring if increase in weight is important.

10. Plenty of potatoes, sweet and white, as permitted, should be

eaten. They may be baked, boiled, or fried in specified oils. You should learn to take them with oil, particularly if weight maintenance is a problem.

11. You can also cook sweet potatoes with maple syrup or sugar, Southern style.

12. The starchy vegetables (as allowed) such as peas, beans, lima beans and squash will increase weight if taken in large quantities, especially if prescribed oils are added.

13. If weight decreases in spite of following these directions, be sure to discuss the situation with your physician, or if away from town, be sure to write for further advice.

MENUS FOR THE ELIMINATION DIETS*

Patients who have actual or possible allergy to foods must be told definitely what they can eat and *must be provided with detailed menus so that adequate and satisfying meals may be prepared or procured away from home.* If on the contrary, they merely are told to exclude certain foods, and are not provided with menus their diet trial in nearly every case will be filled with errors and, from a diagnostic standpoint, will become worthless This subject has been discussed in more detail previously in this chapter.

Thus, as years have passed, *the writer has provided his patients with increasingly more explicit menus and directions about the preparation of meals* The patient is warned to eat only those foods which are included in his diet and to be certain at all times that no trace of a forbidden food is eaten. He is told to refuse any suspected food, remembering that a slight mistake might invalidate diet trial for a week or more. Missing the whole or part of a meal is never serious since proper food can be obtained within an hour or two. It is only with this careful analysis of his meals that the patient can do justice to the study of food allergy as a possible cause of his symptoms.

The various menus which follow have been prepared in more detail and with more practical suggestions than in the writer's former publications. *For the routine patient, the Cereal-free Diet 1, 2, and 3 as noted on page 143 usually is preferred. The combined menu for Diets 1 and 2 also is commonly used, especially if intolerance or allergy to legumes is present* Allergy to rice or corn in Diets 1 and 2 however is more frequent than to legumes. Menus for *diets minus all fruits* are of special use in urticaria, bladder allergy and other conditions where *fruit allergy* is suspected Menus for diets to be taken away from home, in hotels, in restaurants or in friends' homes are detailed. Menus for *infants and young children* have been arranged Menus for Diets 1, 2 and 3 separately are included. Various supplemental elimination diets are proposed. Various changes and substitutions necessitated by rationing and unavailability of certain foods because of the war have been necessary in the menus.

* Printed copies of the various Elimination Diets with their menus and recipes can be purchased from J. W. Stacey, Inc., Flood Bldg, San Francisco, Calif.

All of these menus may have to be changed by eliminations or substitutions according to definite skin reactions or history of food disagreements or dislikes, as discussed on page 143. With supplemental diets (see page 147) the patient must be provided with detailed menus similar to those that follow, so that no question may arise in his mind about the prescribed foods and the various ways in which they can be eaten in order to maintain proper weight and nutrition. The amounts of the various foods taken by the patient must vary according to his caloric requirements, as indicated in the Table on page 204.

As stressed throughout this book, *elimination diets should never be prescribed unless proper nutrition and adequate weight maintenance are assured.*

Cereal-free Elimination Diet 1, 2 and 3 (Rowe)

Foods Allowed

Tapioca*
White potato
Sweet potato or yam
Lima bean potato bread
Soy bean lima bean bread
Soy bean potato tapioca bread

Lamb
Beef
Chicken (no hens)
Bacon
Liver (calves, beef or lamb)

Lettuce
Spinach
Chard

Carrots
Beets
Artichoke
Tomato
Squash
Asparagus
Peas
String beans
Lima beans

Lemon
Grapefruit
Pears
Pineapple
Peaches
Apricots
Prunes

Cane or beet sugar
Salt
Sesame oil
Soy bean oil
Sesame Spread†
Gelatin, plain
Lime, lemon or pineapple flavored gelatin
Maple syrup or syrup made with cane sugar flavored with maple
White vinegar
Vanilla extract
Lemon extract
Royal baking powder
Baking soda
Cream of tartar

* *May be scarce during war.*
† Not available during the war. Sesame oil is also scarce.

Suggested Menu

Breakfast	*Approximate Amounts*
Beverage:	
(*a*) Fresh or canned grapefruit juice served with sugar.	*4 to 6 oz.*
(*b*) Pineapple, apricot, peach, or prune juice, served singly or mixed with grapefruit juice.	
(*c*) Tomato juice (canned and unspiced).	5 to 8 oz.
Cereal Substitute:	
(*a*) Tapioca cooked with water or fruit juice and puréed apricots, peaches, prunes, or pineapple and sugar, served hot with juice of the fruit if desired.(1)	½ cup
(*b*) Tapioca cooked in water, sweetened with sugar and flavored with lemon juice and grated lemon rind, or cooked with caramelized sugar, brown sugar, or maple syrup.(2)	½ cup
(*c*) During the war if tapioca is unavailable (1) soy-potato pudding (8–f), or (2) white or sweet potato may be served. (*If tapioca and potato become unavailable, Elimination Diet 1 and 2 may have to be used even though allergy to rice, corn or rye is suspected.*)	

	Approximate Amounts
Meat:	
(a) Bacon	4 slices
(b) Lamb chops, patties or tongue (unspiced).(3)	2 med. pats
(c) Beefsteak, beef patties or tongue (unspiced).	2 med. pats
(d) Calves, beef or lamb liver and bacon.	2 slices
*Bread:**	
(a) Soy-potato or soy-lima-potato bread (4)(5)	2 slices
(b) Soy-potato muffins.(4)	2 muffins
(c) Soy crackers (8–d)	
(d) Pancakes or waffles made of soy and potato flours, served with maple syrup or sugar (6)	4 medium
Butter Substitute:	
Sesame or soy oil with salt, bacon grease, jams, preserves or jellies of specified *fruits or maple syrup may* be used on bread.	
Jams or Preserves: [illegible]	2 tsp.
Fruit:	
(a) Fresh, cooked, or canned grapefruit, pears, pineapple, peaches or apricots. Fresh peeled pears, peaches and apricots may be eaten raw if allowed by the physician.	½ grapefr't, 1 peach or equiv.
(b) Cooked dried prunes. Lemon juice and sugar may be added as desired. No dried apricots, pears or peaches unless allowed by physician.	4 prunes

This menu contains approximately 770 calories.

Lunch or Dinner

Soup.	
(a) Broth made of lamb, beef, or chicken (no hens) served clear with tapioca or cooked with vegetables as previously listed. (No pepper or spices, no canned soups and no soups away from home.)	1 cup
(b) Lima bean or split pea soup, plain, salted, flavored with bacon (7) (No milk, butter, or any other food to be added.)	1 cup
(c) Tomato soup with soybean (7–a)	
Salad:	
Any combination of vegetables or fruits listed in *this diet*, dressing only of sesame or soy oil, white vinegar or lemon juice, salt and sugar.(25) (Variations: [1] *Lime or lemon* flavored gelatin with grated raw carrots or crushed pineapple. [2] Cooked sliced beets pickled in white vinegar, seasoned with salt and sugar.)	½ cup veg. or fruit 1 Tbsp. oil
Meat:	
(a) Lamb and beef—chops, steak, tongue or liver, ground plain [illegible]	Av liberal serving

[illegible] prunes.)(26)

* Name and address of supervised and trusted baker must be given by the physician. May also be made at home with recipes referred to by number in the Appendix.

Suggested Menu—(Continued)

LUNCH OR DINNER

	Approximate amounts
Vegetables:	
(*a*) Any of those listed in this diet, cooked with salt, without pepper and served with prescribed oil.	½ cup
(*b*) White or sweet potato or yam baked, boiled, or fried in prescribed oils. Prescribed oil and salt may be used.	1 med.
(*c*) Sweet potato or yam candied with brown sugar or maple syrup. Prescribed oil may be added if desired.	1 med.
Bread:	
Choice of those suggested for breakfast.	
Butter Substitute:	
As suggested for breakfast.	
Jams, Preserves or Jellies:	
Choice of those suggested for breakfast.	
Desserts:	
(*a*) Fruit as suggested for breakfast.	½ cup
(*b*) Tapioca fruit pudding.(1)	½ cup
(*c*) Soy-potato pudding (8-f)	
(*d*) Lemon, lime or pineapple flavored gelatin plain, whipped or with fruit added.	½ cup
(*e*) Pears baked with brown sugar.(27)	1 whole pear
(*f*) Lemon, pineapple or apricot water-ice made with juice, sugar and water, with or without gelatin.(28) (Commercial sherbets and ices contain milk, egg or other forbidden foods.)	
(Soy bean; lima-bean; potato cookies, cakes or cup cakes or soy cookies as desired)(8)	
Beverage:	
Choice of those suggested for breakfast.	
Candies:	
(*a*) *Candied grapefruit or lemon peel or glacéd pineapple.(29)* (Made at home)	
(*b*) Dried prunes pitted and stuffed with lemon flavored fondant. (Made at home)	
(*c*) Pure maple sugar candy.	
(*d*) Plain fondant may be made at home and flavored with the fruits on this diet.(9)	

Between meals, if desired, the patient may have lime, lemon or pineapple gelatin, tapioca fruit pudding, canned fruits, cookies, cakes, cupcakes or candy made according to recipes in these diets.

This menu contains approximately 1227 calories.

Total for the day:

Calories	3225	Carbohydrate	368 gm.	Ca	0 336 gm.
		Protein	112 gm.	P	1.398 gm.
		Fat	145 gm.	Fe	0 025 gm.

Comments. The use of the elimination diets as summarized on page 151 and discussed in Chapter V must be accurately followed. Indicated vitamins and the addition of other foods after an adequate period of relief are there discussed. Specific directions for the addition of rice and corn are given on page 200. The effect of the war on the elimination diets is discussed on page 152.

All cereal grains including wheat are excluded from this diet because of the frequency of allergy to the group allergens as well as to specific allergens in all cereal grains (see page 59). The tendency for legumes to produce "gas in the intestines" may necessitate a change to the menu for Diets 1 and 2 on page 159. At times allergic symptoms arise to legumes. Numbered recipes are in the appendix (page 232).

Soy and lima bean flours must be pure, obtained from reliable millers and merchants. If sesame oil is not obtainable, soy bean or pure olive oil (see page 86) may be used unless allergy is evident thereto.

Elimination Diet 1 and 2 (Rowe)

Foods Allowed

Rice
Corn
Rye
Tapioca
Sweet potato or yam

Rice biscuit
Rice bread
Corn pone
Corn-rye muffins
Rye bread
Ry-Krisp

Lettuce
Chard
Spinach
Carrots

Beets
Squash
Asparagus
Artichoke

Lamb
Chicken (no hens)
Bacon
Liver (lamb)

Lemon
Grapefruit
Pears
Pineapple
Peaches
Apricots
Prunes

Cane or beet sugar
Salt
Sesame oil
Mazola oil
Gelatin, plain
Lime, lemon or pineapple flavored gelatin
Maple syrup or syrup made with cane sugar flavored with maple
Karo corn syrup
White vinegar
Vanilla extract
Lemon extract
Royal baking powder
Baking soda
Cream of tartar

Suggested Menu

Breakfast

	Approximate amounts
Beverage:	
(*a*) Grapefruit juice, fresh or canned with sugar.	1 cup
(*b*) Pineapple, apricot, peach or prune juice, singly or mixed with grapefruit juice.	1 cup
Cereal or Cereal Substitute:	
(*a*) Boiled brown or polished rice or cornmeal mush served with apricot or peach juice, and maple syrup or sugar.	¾ cup
(*b*) Corn or rice flakes, puffed rice or Rice *Krispies* served with grapefruit juice and sugar or with apricots, peaches, prunes or pears and the fruit juices.	1 cup
(*c*) Cold boiled rice or sliced cold cornmeal mush fried in Mazola oil, sesame oil or bacon fat and served with maple or Karo syrup.	½ cup or 2 slices
(*d*) Tapioca cooked with water or fruit juice and puréed apricots, peaches, or pineapple with sugar Serve hot.	¾ cup
Meat.	
(*a*) Bacon	4 strips
(*b*) Lamb chops, lamb patties with bacon, lamb or chicken croquettes.(3)	1 med. chop or equiv.
(*c*) Lamb kidney or liver fried with bacon.	
Bread·	
(*a*) Corn pone.(10)	3 slices
(*b*) Corn-rice muffins.(11)	2 muffins
(*c*) Corn-rye muffins.(12)	
(*d*) Rice biscuit.(13)	
(*e*) Rice bread (14)	
(*f*) Ry-Krisp.	
(*g*) Rye bread (15)	2 thin slices
(*h*) Corn and rice flour pancakes served with Karo or maple syrup (16)	2 cakes

Suggested Menus—(Continued)

BREAKFAST

	Approximate amounts
Butter Substitute:	
Mazola or sesame oil with salt, bacon grease, jams, jellies, or preserves of specified fruits, or maple syrup may be used on bread.	
Jams or Preserves:	
(*a*) Apricot, apricot-pineapple, peach or prune jam.(22)	2 tsp.
(*b*) Lemon, grapefruit, or carrot marmalade.(23)	2 tsp.
(*c*) Pear butter.(24a)	
Fruit:	
(*a*) Fresh or canned grapefruit, pears, pineapple, peaches, apricots or prunes	½ grapefr't, 1 peach or pear
(*b*) Cooked dried prunes. Lemon juice and sugar may be added as desired. Do not use dried peaches or apricots, unless ordered by the physician.	4 prunes

This menu contains approximately 956 calories.

LUNCH OR DINNER

Soup:	
(*a*) Lamb or chicken broth, clear or with rice, tapioca or prescribed vegetables added. Salt may be used in cooking but no other seasonings or condiments. (No canned soups or broths or any away from home.)	½ cup
Salad:	
Any cc [illegible] flavored gelatin with grated raw carrots and crushed pineapple.(25) [2] Cooked sliced beets pickled in white vinegar seasoned with salt and sugar.)	½ cup veg. or fruit 1 Tbsp. oil
Meat:	
(*a*) Lamb—chops, roast, or stew with rice, corn or carrots as desired, boiled tongue. Meat may be hot or cold.	2 med. chops or equiv.
(*b*) Chicken (no hens) may be fried, broiled, roasted or fricasseed. Use only rice flour, cornstarch or cornmeal to dredge chicken or to thicken gravy. Fry in Mazola or sesame oil, bacon or chicken fat.	½ fryer or equiv.
(*c*) Lamb or chicken liver sautéed with bacon.	3 slices
(*d*) Lamb patties(3) or lamb or chicken croquettes.(30) (May garnish lamb chops and fried chicken with hot, broiled pineapple, apricots or prunes.)(26)	2 med.
Vegetables:	
(*a*) Spinach, chard, carrots, beets, summer and winter squash, [illegible]	½ cup
(*b*) [illegible] Syrup or sugar may be used.	½ cup
(*c*) Baked, boiled or candied sweet potatoes and yams.	1 med.
(*d*) Hominy.	½ cup

Bread.
(*a*) Corn Crisps with soup and salads.(17)
(*b*) Choice of breads suggested for breakfast.

Approximate amounts

Butter Substitute:
As suggested for breakfast.

Jams, Preserves or Jellies:
Choice of those suggested for breakfast.

Dessert:
(*a*) Fruit as suggested for breakfast.
(*b*) Rice fruit pudding with vanilla sauce (18) — ½ cup
(*c*) Tapioca fruit pudding.(1) — ½ cup
(*d*) Lemon or lime flavored gelatin plain, whipped or with fruit added — ½ cup
(*e*) Pears baked with brown sugar.(15) — 1 pear
(*f*) Rice cupcakes or corn and rice cookies.(19) — 1 cake
(*g*) Rye coffee cake (20)
(*h*) Lemon, pineapple or apricot water-ice made of fruit juice, water and sugar.

Beverage.
Grapefruit, peach, apricot, or pineapple juices or lemonade. — 1 cup

Candies:
(*a*) Candied grapefruit or lemon peel, or glacéd pineapple, made at home (18) — 2 slices
(*b*) Puffed rice candy or marshmallows made at home.(21) — 2 pieces
(*c*) Dried prunes pitted and stuffed with lemon flavored fondant.(9)
(*d*) Pure maple sugar candy.

This menu contains approximately 1193 calories.
Total for day, 3342 calories

Carbohydrate	325 gm.	Ca	0 319 gm.
Protein	110 gm.	P	1.511 gm.
Fat	178 gm.	Fe	0 022 gm.

NOTE —The directions for the use of the elimination diets as summarized on page 151 and discussed in Chapter V must be accurately followed. These diets are legume-free and also exclude tomato and potato The bakery products must be made according to numbered recipes (page 232) or by honest bakers according to such recipes. Calcium and vitamins must be given as suggested on page 151. The effect of the war on the elimination diets is discussed on page 152.

Elimination Diet 1 (Rowe)

Foods Allowed

Tapioca*	Lemon	Lime and lemon flavored gelatin
Rice	Grapefruit	Maple syrup or syrup made with cane sugar flavored with maple
	Pears	
Rice biscuit		
Rice bread	Lamb	Lemon extract
Lettuce		Vanilla extract
Chard	Sugar	Royal baking powder
Spinach	Salt	Cream of tartar
Carrots	Sesame oil	Baking soda
Sweet potato	Olive oil	
Yam	Gelatin, plain	

* Scarce or unavailable during the war.

Suggested Menu

Breakfast

	Approximate amounts
Beverage:	
(*a*) Grapefruit juice or lemonade with sugar added as desired. May be hot or cold.	½ cup
(*b*) Pear juice flavored with lemon.	⅔ cup
Cereal or Cereal Substitute:	
(*a*) Boiled brown or polished rice served hot with pear juice, maple syrup or syrup made with cane sugar flavored with maple.	½ cup
(*b*) Rice flakes, Rice Krispies or puffed rice served with pears and pear juice and sugar.	¾ cup
(*c*) Tapioca cooked in water and sugar, with caramelized sugar or with lemon juice and grated lemon rind and sugar.(2)	½ cup
Meat:	
(*a*) Lamb chops or lamb patties.(3)	1 med.
(*b*) Lamb tongue served hot or cold.	3 slices
(*c*) Lamb liver fried in sesame oil.	2 slices
Bread:	
(*a*) Rice biscuits.(13)	1 biscuit
(*b*) Rice bread.(14)	2 slices
Butter Substitute:	
Sesame or olive oil with salt, jams, and jellies of specified fruits or maple syrup may be used on the bread.	
Jams or Preserves:	
(*a*) Lemon, grapefruit or carrot marmalade.(23)	2 tsp.
(*b*) Pear butter.(24a)	2 tsp.
Fruit:	
(*a*) Sectioned or half large grapefruit, fresh or canned, with sugar.	¾ cup
(*b*) Fresh or canned pears.	2 halves

This meal contains approximately 747 calories.

Lunch or Dinner

Soup:	
Lamb broth, clear or with tapioca, rice and carrots added. No pepper, spices, flavors, and no canned soup.	1 cup
Salad:	
(*a*) Hearts of lettuce with sesame or olive oil and lemon juice dressing.	¼ head 1 Tbsp. oil
(*b*) Vegetable salad of lettuce, chopped tender spinach leaves and diced cooked carrots. Serve with sesame or olive oil and lemon juice.	½ cup veg. 1 Tbsp. oil
(*c*) Sectioned grapefruit or halves of pears served on shredded lettuce.	½ pear
(*d*) Grated raw carrot, sectioned grapefruit, or halves of pears molded in lime or lemon flavored gelatin.(25)	½ cup
Meat:	
(*a*) Lamb roast and chops.	2 med. chops
(*b*) Stew made of lamb, rice and carrots. Thicken gravy with rice flour.	1 cup
(*c*) Lamb kidney, liver and boiled tongue.	3 slices
Vegetables:	
(*a*) Boiled brown or polished rice. Cold cooked rice may be fried in sesame oil.	½ cup

	Approximate amounts
Vegetables:	
(*b*) Baked, boiled or candied sweet potatoes or yams. Use sesame oil and brown sugar or maple syrup to candy the sweet potatoes.	1 med.
(*c*) Steamed spinach, chard or carrots. Flavor with salt and sesame oil.	3 Tbsp.
Bread:	
Rice bread or rice biscuit (14)	2 slices
Butter Substitute:	
As suggested for breakfast.	1 Tbsp.
Jams, Preserves, or Jellies:	
Choice of those suggested for breakfast.	2 tsp.
Desserts:	
(*a*) Pears baked with maple syrup or brown sugar.(27)	1 whole pear
(*b*) Rice cupcakes or rice cookies (19)	1 cake
(*c*) Lemon or lime flavored gelatin; plain, whipped or with grapefruit or pears.	½ cup
(*d*) Tapioca flavored with caramel or lemon juice and lemon rind and sugar.(2)	½ cup
(*e*) Rice pudding flavored with lemon juice and rind, served with lemon sauce (18b)	½ cup
(*f*) Lemon water-ice made at home (28a) (Commercial ices or sherbets contain milk or eggs.)	
Beverage:	
(*a*) Grapefruit juice or lemonade with sugar.	1 cup
(*b*) Pear juice	1 cup
Candies:	
(*a*) Candied lemon or grapefruit peel.(29a)	3 slices
(*b*) Puffed rice candy or marshmallows made at home (21)	2 pieces
(*c*) Maple sugar candy, pure.	
(*d*) Fondant.(9)	

This menu contains approximately 1328 calories. Total for the day, 3403 calories.

Carbohydrate	336 gm.	Ca	0.350 gm.
Protein	132 gm.	P	1.359 gm.
Fat	170 gm.	Fe	0.207 gm.

NOTE.—The directions for the use of the elimination diets as summarized on page 151 and discussed in Chapter V must be accurately followed. Numbers in menu refer to recipes (see page 232). Olive oil is allowed, if it produces no allergy. Possible adulteration of oils must be kept in mind. The effect of the war on the elimination diets is discussed on page 152.

Elimination Diet 2 (Rowe)

Foods Allowed

Corn	Pineapple	Gelatin, plain or flavored with pineapple
Rye	Peach	Karo corn syrup
Corn pone	Apricot	Maple syrup or syrup made with cane sugar flavored with maple
Corn-rye muffin	Prune	White vinegar
Rye bread	Chicken (no hens)	Vanilla extract
Ry-Krisp	Bacon	Royal baking powder
Beets	Sugar	Cream of tartar
Squash	Salt	Baking soda
Asparagus	Mazola oil	
Artichoke	Sesame oil	

Suggested Menu

Breakfast

	Approximate amounts
Beverage:	
(*a*) Pineapple or prune juice.	½ cup
(*b*) Apricot, peach and pineapple juices mixed with sugar.	½ cup
Cereal:	
(*a*) Cornflakes served with apricots, peaches or prunes and juice and sugar.	1 cup 4 prunes
(*b*) Cornmeal mush served hot with maple or Karo syrup.	½ cup
(*c*) Sliced cold cornmeal mush fried in Mazola oil or bacon fat served with syrup and strips of bacon.	3 slices 4 strips
Meat:	
(*a*) Bacon.	4 strips
(*b*) Chicken croquettes.(30)	2
(*c*) Sautéed chicken livers with bacon.	3 Tbsp.
Bread:	
(*a*) Corn pone.(10)	2 slices
(*b*) Corn and rye muffins.(12)	2 muffins
(*c*) Rye bread.(14)	2 thin slices
(*d*) Ry-Krisp.	2 wafers
Butter Substitute:	
Mazola or sesame oil with salt, bacon grease, jams, preserves or jellies of specified fruits or maple syrup may be used on the bread.	1 Tbsp.
Jams, Preserves, or Jellies:	
Peach, prune, apricot or pineapple.	2 tsp.
Fruit:	
(*a*) Fresh or canned pineapple, peaches, apricots or prunes.	2 slices
(*b*) Stewed dried prunes. Do not use dried apricots or peaches.	4 prunes

This menu contains approximately 895 calories.

Lunch or Dinner

Soup:	
Chicken broth. (No pepper, seasonings and no canned or restaurant broth.)	½ cup
Salad:	
(*a*) Any combination of artichoke hearts, beets and asparagus with Mazola or sesame oil and white vinegar.	1 cup mixed veg. or equiv.
(*b*) Cold sliced beets marinated in white vinegar, seasoned with salt and sugar.	5 slices
(*c*) Any combination of pineapple, peaches, apricots and prunes. Any of these fruits may be molded in plain or pineapple flavored gelatin. Mazola oil, salt and white vinegar may be used.	½ cup
Meat:	
(*a*) [illegible] frying.	½ fryer or equiv.
(*b*) Chicken croquettes.(30)	2 med.
(*c*) Sautéed chicken livers	½ cup

	Approximate amounts
Vegetables:	
(a) Fresh or canned beets, corn, squash, asparagus and artichokes with salt and Mazola oil if desired.	½ cup
(b) Hominy.	½ cup
Bread:	
(a) Choice of those suggested for breakfast.	
(b) Corn Crisps—serve with salad or soup.(28)	2
Butter Substitute:	
As suggested for breakfast.	1 Tbsp.
Jams, Preserves, or Jellies:	
Choice of those suggested for breakfast	2 tsp.
Desserts:	
(a) Fruits as suggested for breakfast.	
(b) Rye coffee cake.(20)	2 cookies
(c) Cornstarch pudding with crushed fruit.(31)	½ cup
(d) Jellied prunes and pineapple.(32)	4 prunes
(e) Plain or pineapple flavored gelatin with fruits listed in this diet.	½ cup
Beverage:	
Choice of those suggested for breakfast.	
Candies:	
(a) Candied pineapple (29a)	1 slice
(b) Dried pitted prunes stuffed with candied pineapple or vanilla flavored fondant.(9)	2 prunes

This menu contains approximately 1036 calories.

Total for the day: Calories 2968

Carbohydrate	322 gm.	Ca	0.290 gm.
Protein	89 gm.	P	1.401 gm.
Fat	147 gm	Fe	0.019 gm.

NOTE.—The use of elimination diets as summarized on page 151 and discussed in Chapter V must be accurately followed. Addition of extra vitamins is there discussed. Numbers in menus refer to recipes (see page 232). The effect of the war on the elimination diets is discussed on page 152

Elimination Diet 3 (Rowe)

Foods Allowed

Tapioca*	Lima beans	Sesame oil
White potato	Soy beans	Soy bean oil
	String beans	Gelatin, plain
Soy-lima-potato bread	Peas	Lime or lemon flavored gelatin
Soy-potato bread or muffins		
	Lemons	Maple syrup or syrup made with cane sugar flavored with maple
	Grapefruit	
Beef	Peaches	
Bacon	Apricots	Vanilla extract
		Lemon extract
Tomato		Royal baking powder
Carrots	Sugar	Baking soda
	Salt	Cream of tartar

* If tapioca and potato are unavailable during the war, then Diets 1 or 2 must be used depending on possible allergy to rice, corn, or rye.

Suggested Menu

Breakfast

Approximate amounts

Beverage:
- (*a*) Grapefruit juice or lemonade with sugar as desired. ½ cup
- (*b*) Tomato juice. ½ cup

Cereal Substitute:
- (*a*) Tapioca cooked with apricot or peach juice or with puréed fruit and sugar.(1) ½ cup
- (*b*) Tapioca cooked in water, sweetened with sugar and flavored with lemon juice and grated lemon rind, caramel, brown sugar or maple syrup.(2) ⅓ cup
- (*c*) During the war, if tapioca is unavailable, (1) white potato *must be served (see lunch menu) or (2) soy-potato pudding* may be used.(8-f)

Meat:
- (*a*) Bacon. 4 slices
- (*b*) Beefsteak or beef patties. 2 med. pats
- (*c*) Calves or beef liver and bacon. 2 slices
- (*d*) Boiled beef tongue, cooked plain. 2 slices
- (Hashed brown potatoes cooked in prescribed oils can be served with meats.) ⅓ cup

Bread:
- (*a*) Soy bean-potato or soy-lima-potato breads.(4) 2 slices
- (*b*) Soy-lima-potato muffins.(5) 2 muffins
- (*c*) Soy bean pancakes served with maple syrup or syrup made of cane sugar flavored with maple.(6) 4 med.

Butter Substitute:
Sesame or soy bean oil with salt, bacon grease, jams, preserves, jellies or maple syrup may be used on bread. 1 Tbsp.

Jams or Preserves:
- (*a*) Lemon, grapefruit or carrot marmalade.(23) 2 tsp.
- (*b*) Peach or apricot jam. 2 tsp.
- (*c*) Tomato preserves flavored with lemon.(24) 2 tsp.

Fruit:
- (*a*) Fresh or canned grapefruit with sugar. ½ grapefruit
- (*b*) Peaches or apricots (fresh or canned). 1 peach or 3 apricots
- (*c*) Sliced tomatoes with sugar.

This menu contains approximately 656 calories.

Lunch or Dinner

Soup:
- (*a*) Beef broth clear (not canned) or with tapioca, carrots, tomatoes, lima beans or peas (no pepper). ½ cup
- (*b*) Lima bean soup flavored with bacon.(7) ½ cup
- (*c*) Vegetable broth made with tomatoes, carrots, lima beans, string beans and diced potatoes.(33) ½ cup

Salad:
- (*a*) Vegetable salad of any combination of tomatoes, carrots, lima beans, string beans and peas. Serve with sesame or soy oil, lemon juice and salt. ⅓ cup
- (*b*) Fruit salad of grapefruit, peaches and apricots. (Use lemon or lime flavored gelatin with any of the listed fruits or vegetables. Cut tender young carrots into long thin strips and place in iced salted water *for one-half hour. Use as a garnish* for salads or as an appetizer.) ¾ cup

	Approximate amounts
Meat:	
(a) Beef served as steak, roast, patties or meat loaf.(34)	Liberal
(b) Beef stew with white potatoes, carrots, tomatoes, peas, lima beans or string beans Thicken gravy with potato starch.	serving of meat
(c) Calves or beef liver and bacon.	3 slices
(d) Boiled calves or beef tongue, cooked plain.	3 slices
Vegetables:	
(a) White potatoes may be baked, boiled, riced, hash browned or French fried, salted to taste. Use only sesame or soy bean oil	1 med.
(b) Fresh or canned tomatoes, carrots, lima beans, string beans, peas or soy beans.	½ cup
Bread:	
Choice of those suggested for breakfast.	
Butter Substitute.	
As suggested for breakfast.	1 Tbsp.
Jams, Preserves, or Jellies:	
Choice of those suggested for breakfast.	2 tsp.
Dessert:	
(a) [illegible]	
(b)	
(c)	½ cup
(d) Lemon or apricot water-ice made at home (28)	½ cup
(e) Soy, or soy-potato cookies or cupcakes (8)	2 cookies
Beverage:	
(a) Grapefruit juice or lemonade with sugar as desired.	½ cup
(b) Tomato juice	½ cup
Candies:	
(a) Candied grapefruit or lemon peel (29)	2 slices
(b) Fondant flavored with vanilla, lemon or apricot.(9)	2 pieces
(c) Pure maple sugar candy.	

This menu contains approximately 1267 calories.

Total for the day. Calories 3190.

Carbohydrate	330 gm	Ca	0 300 gm.
Protein	105 gm.	P	1.203 gm.
Fat	161 gm.	Fe	0.024 gm.

NOTE —The use of the elimination diets as summarized on page 151 and discussed in Chapter V must be accurately followed. Indicated vitamins are there discussed. Numbers in menus refer to recipes on page 232. The effect of the war on the elimination diets is discussed on page 152.

FRUIT-FREE ELIMINATION DIETS

Some food-sensitive patients are allergic to several fruits and some apparently are allergic to all fruits. A few individuals can take cooked but not uncooked fruits. Some are sensitive to the skins and not to the meat of the fruits. Allergy to fruits may be extremely specific; it may be restricted to one species of melon, apple, or grape.

In rare patients with fruit aller[illegible] cially in the gastro-intestinal tr[illegible] occasional allergy to the synth[illegible] may occur. If this can be pro[illegible] [illegible] imperative to eat enough vegetables rich in vitamin C to prevent avitaminosis (see page 146).

These fruit-free elimination diets as well as indications for their use have been discussed on page 146.

✓Fruit-free, Cereal-free Elimination Diet 1, 2 and 3 (Rowe)

Foods Allowed

Tapioca*	Beets	Cane or beet sugar
White potato	Squash	Sesame oil
Sweet potato or yam	*Asparagus*	*Soy bean oil*
	Artichoke	Gelatin
Lima bean-potato bread	Tomato†	Salt
Soy bean-lima bean bread	Lima beans	Maple syrup‡ or syrup made with cane sugar flavored with maple
Soy bean-potato-tapioca bread	String beans	
	Lamb	Vanilla extract
Chard	*Beef*	*Royal baking powder*
Spinach†	Chicken (no hens)	Baking soda
Carrots	Bacon	Cream of tartar
		Acetic acid (6%) vinegar

* [illegible]
† [illegible] history. (See Comments.)
‡ [illegible]

Suggested Menu

Breakfast

	Approximate amounts
Beverage:	
Tomato juice (canned and unspiced) or carrot juice (canned) or pressed from raw carrots (brought to a boil and cooled).	5 to 8 oz.
NOTE.—If allergy to tomato is suspected, tea or Maté (Brazilian tea) may be used in the initial diet.	
Cereal Substitute:	
(a) Tapioca (Instant or Pearl) cooked with water and maple *syrup, granulated, brown or caramelized sugar.(2)*	1 large *helping*
(b) Soy-potato starch pudding, flavored with caramel or vanilla and no fruits.(8-f)	
(c) Pancakes or waffles made of soy and lima bean flours, served with maple syrup.(6)	4 med. cakes
Meat:	
(a) Bacon.	4 slices
(b) *Lamb or beef—chops, steak, patties, or tongue (unspiced).*	*2 med.* chops or equiv.
(c) Lamb, calves or beef liver and bacon.	
Bread:	
(a) Bread made of any combination of soy bean, lima bean, and potato starch flours.(4)	2 to 4 slices toasted
(b) Muffins made of above flours.(5)	2 muffins
Butter Substitute:	
Sesame or soy bean oil with salt, bacon grease, or maple syrup may be used on bread.	1 Tbsp.
Jams or Preserves:	
Tomato or carrot preserves *(made without lemon juice), or maple* syrup. (24)	*2 tsp.*
Fruit Substitute:	
Tomato, fresh cooked or canned, served with sugar if desired.(35)	½ cup

This menu contains approximately 587 calories.

Lunch or Dinner	*Approximate amounts*
Soup:	
(a) Broth made of lamb, beef, or chicken (no hens), served clear with tapioca or cooked with the vegetables listed. (No pepper or spices, no canned soups.)	1 cup
(b) Lima bean or split pea purée, flavored with bacon (7)	1 cup
Salad.	
(a) [illegible]	1 cup mixed veg. 1 Tbsp. oil
[illegible] gar.	
(b) Molded salad using plain gelatin and vegetables previously listed. French dressing as in (a).	
Meat:	
(a) Lamb and beef—chops, steak, ground plain meat, roast (hot or cold) cooked with salt in their own fats or with specified oil. No pepper, condiments or sauces. Gravies thickened with potato starch or soy bean flour.	Av. liberal serving
(b) Beef, lamb or calves tongue and liver cooked as above.	
(c) Chicken (no hens) may be roasted, fried, broiled or fricasseed. Sesame or soy bean oil and salt may be used. Thicken gravy with potato starch or soy bean flour.	½ broiler or fryer or equiv.
Vegetables:	
(a) Any of those listed in this diet, cooked without pepper, and served with sesame or soy bean oil and salted to taste.	4 Tbsp. veg.
(b) White or sweet potato or yam, baked, boiled, or fried in above oils.	1 med. sized potato
(c) Sweet potato or yam candied with brown sugar or maple syrup and sesame oil if desired.	
Bread:	
Choice of those suggested for breakfast.	
Butter Substitute.	
As suggested for breakfast.	
Jams or Preserves.	
As at breakfast.	
Dessert:	
(a) Tapioca cooked as at breakfast	Av. serving
(b) Cookies, cake or cupcakes made of any combination of soy, lima, and potato starch flours and tapioca.(8)	2 cookies or 1 cupcake
Beverage:	
As at breakfast.	5 to 8 oz.

This menu contains approximately 1263 calories.

Total for the day: Calories 3112.

Carbohydrate	264 gm.	Ca	0.370 gm.
Protein	136 gm	P	1.459 gm.
Fat	168 gm.	Fe	0.024 gm.

Comments [illegible] on pa[illegible] main [illegible] carry [illegible] included in this diet, as discussed on pages 140 and 154 is necessary. [illegible] proper intake of the calorie-

When the allergic manifestation has been absent for an adequate period, then various foods, one every five to seven days, may be added. The addition of fruits should be delayed for one to three months. All fruits may reproduce symptoms or cooked fruits only may be tolerated. At times tolerance to allergenic fruits

returns only after their elimination for weeks or months. Fruit allergy may persist for years. Possible hyposensitization to fruits in such cases is discussed on page 57. Some fruit-sensitive patients are also allergic to tomato. In these cases tomato should be excluded. Spinach allergy may occur. Allergy to many other vegetables occasionally may be present. The use of additional calcium and vitamins and especially of vitamin C is discussed in directions for the use of diets on pages 140 and 151. Possible allergy to cevitamic acid may exist (see page 146). Dilute acetic acid (6%), obtained from the druggist, may be used in place of vinegar. White vinegar may be tried after relief occurs.

The effect of the war on the elimination diets is discussed on page 152.

Fruit-free Elimination Diet 1 and 2 (Rowe)

Foods Allowed

Rice	Carrots	Sesame oil
Corn	Beets	Gelatin
Rye	Squash	Acetic acid (6%) vinegar
Tapioca	Asparagus	Maple syrup† or syrup made with cane sugar flavored with maple
Sweet potato or yam	Artichoke	Karo syrup
	Tomato*	Vanilla extract
Rice bread	Lamb	Royal baking powder
Corn pone	Chicken	Baking soda
Corn-rye muffins	Bacon	Cream of tartar
Rye bread		
Ry-Krisp	Sugar	
	Salt	
Chard	Mazola oil	
Spinach*		

* Should be eliminated if allergy thereto is suggested by history. (See Comments on page 169.)

† Maple allergy may exist in fruit-sensitive patients.

Suggested Menu

BREAKFAST	*Approximate amounts*
Beverage:	
Tomato juice (canned and unspiced) or carrot juice (canned) or pressed from raw carrots (brought to a boil and cooled)	5 to 8 oz.
NOTE.—If tomato allergy is suspected, tea or Maté (Brazilian tea) may be ordered.	
Cereal:	
(a) Boiled brown or polished rice or cooked cornmeal served with sugar, granulated or brown, maple syrup or Karo corn syrup.	½ cup
(b) Rice Krispies or corn flakes served as above.	¾ cup dry flakes
(c) Cold cooked rice or cornmeal fried in Mazola oil, sesame oil or bacon fat, served with maple syrup or Karo corn syrup.	
Meat:	
(a) Bacon.	4 slices
(b) Lamb—chops, croquettes, patties or tongue (27)	1 med. cho[p] or equi[valent]
(c) Lamb liver and bacon.	
Bread:	
(a) Corn pone.(10)	2 muffins
(b) Corn-rice muffins.(11)	
(c) Corn-rye muffins.(12)	

BREAKFAST	*Approximate amounts*
Bread:	
(*d*) Rice bread (14)	2 to 4 slices toasted
(*e*) Rye bread.(15)	
(*f*) Ry-Krisp.	
Butter Substitute:	
Mazola or sesame oil with salt, bacon grease, or maple syrup may be used on bread.	1 Tbsp.
Jams or Preserves:	
Tomato or carrot preserves (made without lemon juice).	2 tsp.
Fruit Substitute.	
Tomato, fresh cooked or canned, served with sugar if desired.(35)*	½ cup

This menu contains approximately 526 calories.

LUNCH OR DINNER	
Salad.	
(*a*) Combination salad containing any of the vegetables listed. White vinegar, Mazola or sesame oil, and salt may be used as a dressing	1 cup mixed veg. 1 Tbsp. oil
(*b*) Molded salad made of plain gelatin and vegetables listed. French dressing as above.	
Soup:	
(*a*) Broth made of lamb or chicken (no hens), cooked with vegetables included in this diet and thickened with rice flour, cornstarch or tapioca May be seasoned with salt but no pepper or condiments may be used.	1 cup
(*b*) Plain chicken broth with rice, seasoned with salt. (No canned or restaurant soups)	
Meat:	
(*a*) Lamb chops, roast, tongue, liver, or lamb stew with rice, corn, carrots, beets and tomato, cooked in their own fats or with sesame or Mazola oil and salt.	2 med. chops or equiv.
(*b*) Chicken (no hens) may be roasted, fried, broiled, stewed. Sesame or Mazola oil and salt may be used. Dredge chicken in rice flour. Thicken gravy with rice flour or cornstarch.	¼ broiler or fryer or equiv.
Vegetables:	
(*a*) Sweet potato or yam, boiled, baked, candied, or fried in specified oils	1 med. sized potato
(*b*) Any vegetables listed in this diet, cooked with salt, without pepper, and served with Mazola or sesame oil.	4 Tbsp.
(*c*) Hominy or steamed rice.	
Bread:	
Choice of those suggested for breakfast	
Butter Substitute:	
As at breakfast.	
Jams or Preserves	
As at breakfast.	
Dessert	
(*a*) Cold cooked rice or cornmeal fried in prescribed oils served with maple or corn syrup, or vanilla pudding sauce.(32)	Av. helping
(*b*) Tapioca cooked with water and granulated, brown, or caramelized sugar, or maple or corn syrup (2)	
(*c*) Rice or rye cookies (19)	
Beverages:	
As at breakfast.	

This menu contains approximately 1021 calories.

Total for the day: Calories 2568.

Carbohydrate	230 gm.	Ca	0.256 gm.
Protein	133 gm.	P	1.696 gm.
Fat	124 gm.	Fe	0.025 gm.

Comments. The suggestions as detailed on page 169 apply to this diet. The effect of the war on the elimination diets is discussed on page 152.

MEALS EATEN AWAY FROM HOME IN HOTELS, RESTAURANTS, TRAINS, OR FRIENDS' HOMES

Adherence to an elimination diet is usually possible away from home if the patient insists on accuracy of selection and cooking of foods. Rigorous adherence to the diet as ordered is necessary during the diagnostic period while food allergy is being studied and often thereafter if marked sensitizations to specific foods are discovered. The menus which follow have been designed to aid the patient when he must eat in public places or in friends' homes. They contain plain foods such as dry cereals or plain cooked cornmeal or rice, fruit juices, unseasoned and unbuttered vegetables, baked or boiled potatoes in their jackets, cooked meats without gravies, pepper, flavors, or sauces, plain fresh or canned fruits, Ry-Krisp or bread or cookies carried by the patient made at home or by his reliable baker. In restaurant, hotel, or dining car, such foods can be ordered. Special insistence is always necessary, however, to obtain unseasoned meats, cooked without butter or gravy, and plain vegetables. If these are not served, the patient should request other properly prepared foods. At no time should he eat food which may contain a forbidden ingredient, such as milk or its products, wheat, egg, or other excluded foods. He always may eat more of the correctly selected foods or eat in one to four hours thereafter of foods allowed in his diet If he continues to eat at one hotel or restaurant, careful explanation to waitress, waiter and if possible, to the cook will insure greater accuracy. However, the patient always should be vigilant in order to avoid carelessness or occasional mistakes. If he can see the food actually cooked, errors are less likely to occur.

Eating at friends' homes is always difficult Unless the friend thoroughly understands the patient's diet and the reasons for it, mistakes are inevitable. Therefore, it is best to eat before going to such homes or to limit the food to simple articles such as sliced tomato, plain meat and vegetables, baked or boiled potato, and canned or fresh fruit. During the important diagnostic period slight mistakes should not be allowed.

Patients who eat in boarding houses must explain their menus to the cook and attendants. For a small additional sum, extra attention usually is available and accurate meals are provided. If he cannot obtain this service, then he should find another boarding house before embarking on an investigative period of trial diet. Slight inaccuracies often make diet trial worthless.

Undesirable weight loss should not be permitted, and can be prevented, as discussed on page 142 by eating additional quantities of prescribed foods, as outlined on page 154. If adequate amounts of the allowed foods are not served at the meals, then the patient should have extra bakery products obtained from his reliable baker, extra canned or fresh prescribed fruits, extra cold meat obtained from a delicatessen and possibly other prescribed foods including extra sugar which can be eaten in his room. Nutrition must be protected, as discussed on page 140.

Cereal-free Elimination Diet 1, 2 and 3 (Rowe)

(Eaten Away From Home)

Foods Allowed

Tapioca	Tomato	Cane or beet sugar
White potato	Lima beans	Soy bean oil
Sweet potato or yam	String beans	Sesame oil
	Peas	Salt
Soy-potato bread		Gelatin, plain, or flavored with lime, lemon or pineapple
Soy-lima-potato bread or muffin	Lamb	
	Beef	
	Chicken (no hens)	Maple syrup or syrup made with sugar flavored with maple
	Bacon	
Lettuce		
Chard	Lemon	White vinegar
Spinach	Grapefruit	Vanilla extract
Carrots	Pears	Lemon extract
Beets	Pineapple	Royal baking powder
Squash	Peach	Baking soda
Asparagus	Apricot	Cream of tartar
Artichokes	Prune	

Suggested Menu

Breakfast

Beverage

Grapefruit juice—5 to 7 ounces, with sugar. Other fruit juices listed below may be used.

Cereal Substitute.

(a) Tapioca, cooked with pear, peach, apricot and sugar.(1) (See Comments)
(b) Potatoes—white or sweet—baked or boiled, or fried in sesame or pure soy bean oil.

Bread.

Soy-potato or soy-lima-potato bread, muffins, or other bakery products (4)(5) (See Comments)
Jam or jelly of specified fruits or maple syrup may be used on bread.

Meat.

Bacon—several slices (fried in clean pan alone).

Fruit.

Pears, peaches, apricots, prunes, or pineapple—canned, cooked dried, or fresh.

Water.

Suggested Menu—(Continued)

Lunch or Dinner

Salad:

Made of vegetables or fruits listed below. Dressing of sesame or soy bean oil with lemon or white vinegar and salt may be used. (See note below.)

Meat:

Lamb, mutton or beef—steak, chops, roast (hot or cold), cooked in their own fat or with prescribed oils and salt. (No gravy.)

Vegetables:

Lettuce, tomato, spinach, chard, carrots, squash, asparagus, peas, artichokes, beets, string beans, and lima beans. (Prescribed oils, lemon, white vinegar, and salt may be used.)

Potatoes:

White or sweet potatoes or yams, baked or boiled, or fried in sesame or pure soy bean oil.

Jams and Jellies:

As at breakfast.

Bread:

As at breakfast.

Dessert:

Fruits or tapioca as at breakfast.
Soy or soy-potato cakes or cookies.(8)

Beverages:

Grapefruit, pear, peach, apricot, pineapple, or tomato juices.
Water. (Tea if ordered by physician.)

Comments. 1. The directions for the use of this elimination diet as summarized on page 151 and discussed in Chapter V must be accurately followed. The effect of the war on elimination diets is discussed on page 152.

2. Since cereals are excluded, tapioca cooked with prescribed fruits and sugar and water is the only cereal substitute. It can be made rapidly from instant tapioca by any cook. Clean utensils free of all traces of other foods are essential.

3. If tapioca is unavailable, potato or soy-potato starch pudding may be eaten. [illegible]

[illegible] rant or carried by the patient. If soy bean oil is used, it must be pure.

6. No hotel made, restaurant made, or canned soups are allowed.

7. Meats, vegetables, and potatoes must be cooked plain; salt should be added by the patient. Prescribed oils may be used if desired

8. Fruit salad in cans is permissible. It may be taken even if it contains a few grapes.

9. Extra vitamins and calcium may be required (see directions for the use of the elimination diets, page 151). Proper weight maintenance, if necessary by ingesting extra amounts of the calorie-carrying foods, is important (see page 154).

10. The physician must be assured of adequate nutrition in the patient and must supervise this diagnostic trial diet so that it is accurately followed (see pages 135 and 140).

Elimination Diet 1 and 2—with Cereals (Rowe)

(Eaten Away From Home)

Foods Allowed

Rice
Corn
Rye
Tapioca
Sweet potato or yam

Rice biscuit
Rice bread
Corn pone
Corn-rye muffins
Rye bread
Ry-Krisp

Lettuce
Chard
Spinach
Carrots

Beets
Squash
Asparagus
Artichoke

Lamb
Chicken (no hens).
Bacon

Lemon
Grapefruit
Pears
Pineapple
Peaches
Apricots
Prunes

Cane or beet sugar
Salt
Mazola oil
Sesame oil
Gelatin, plain
Lime, lemon or pineapple flavored gelatin
Maple syrup or syrup made with cane sugar flavored with maple
Karo corn syrup
White vinegar
Vanilla extract
Lemon extract
Royal baking powder
Baking soda
Cream of tartar

Suggested Menu

Breakfast

Beverage:
Grapefruit juice—5 to 6 ounces, with sugar.

Cereal·
(*a*) Cornflakes.
(*b*) Rice flakes or Rice Krispies
(*c*) Cooked cornmeal.
(*d*) Boiled rice.
(All served *with the juices* of grapefruit, pear, peach, apricot or prunes with sugar or with maple syrup.)

Bread·
(*a*) Ry-Krisp.
(*b*) Rice, corn, or rye breads, muffins, or other bakery products brought from home or from supervised bakers made from recipes in this volume (10-16)

Jellies or Jams:
Those of fruits on the diet may be used. (No butter allowed.) These or maple syrup may be used on bread.

Meat·
Bacon—several slices.

Fruit·
Pear, peach, pineapple, prunes—canned, cooked dried or fresh (peeled).

Lunch or Dinner

Salad·
Made of plain vegetables (listed below). Dressing of Mazola, pure olive or sesame oil with lemon or white vinegar and salt. (No cottonseed oil should be used)

Meat:
(*a*) Beef or lamb—chops, steak, or roasts (hot or cold) cooked in their own fats with salt. No pepper or spices No gravies
(*b*) T[illegible] er may be used, cooked plain as above.

Suggested Menu—(Continued)

LUNCH OR DINNER

Vegetables:

Lettuce, tomato, spinach, chard, carrots, squash, asparagus, peas, artichokes, beets, string beans, and lima beans. (Prescribed oil, lemon and salt only may be used.)

Potatoes:

White or sweet, or yams, boiled, baked, or fried only in proper oil.

Jams or Jellies:

As at breakfast.

Bread:

Bread, cookies, and other bakery products as at breakfast.(10–19)

Fruit:

As at breakfast.

Beverages:

Pineapple, grapefruit, apricot, peach, pear or tomato juice.

[illegible] zed

[illegible]

[illegible] unt prescribed assures sufficient vitamin C intake for the day. Other prescribed fruit juices or tomato juice may be taken. If grapefruit juice is not available, additional vitamin C may be required.

3. Ry-Krisp (Ralston) contains only rye flour and salt. Any other bread or bakery product must be brought by the patient to the meal and must be made at home or by honest, supervised bakers as discussed on page 138 from recipes in this book.

4. No restaurant or hotel made, or canned soups can be taken since they contain pepper, [illegible]

5. Me [illegible] plain without butter, milk, or peppe [illegible] ne or soy bean oil should be brought in a stoppered bottle to meals. *Possible adulterants in commercial salad oils are difficult to detect and to identify.*

6. The patient must not eat or taste any food suspected of containing any food, *flavor, coloring or spice not allowed on his diet.*

7. Clean spoons and cooking utensils as advised on page 139 are imperative.

8. The physician must supervise the accurate execution of this diagnostic trial *diet as discussed on page 140.*

Fruit-free Elimination Diets 1, 2 and 3, and Fruit-free, Cereal-free Elimination Diets 1, 2 and 3

(EATEN AWAY FROM HOME)

Menus for these diets are similar to those outlined on pages 168 to 172. The physician, dietitian, or patient, should write out the diet to be followed. The advice and precautions given in the former menus as well as in the diets, for hotels, restaurants, etc., on pages 173 to 174 are important and must be followed.

Since fruits are excluded from these diets, more of the tapioca cooked with sugar (see page 156), more of the vegetables and potatoes and allowed bakery products will be required as stressed in the fruit-free menus on pages 168 to 172. Proper nutrition, vitamin intake, and weight must be maintained.

MODIFICATION OF ELIMINATION DIETS IN THE PRESENCE OF OTHER DISEASES

When patients have a marked gastro-intestinal syndrome, such as "colitis" or peptic ulcer, the prescribed elimination diet may be prepared in a smooth, non-irritating form by puréeing or straining all fruits and vegetables and by cooking nearly all the foods. Meats should be finely minced and carefully cooked with

to the patient's tolerance and the relief of his symptoms. As noted on page 121, increasing evidence indicates that certain cases of ulcerative colitis are due to food allergy and that a similar cause may be responsible for many so-called irritable or unstable colons. In the latter cases, the smooth, non-irritating elimination diets, as described, are indicated for diagnostic study of possible allergy. A specially designed diet for the study of possible food allergy in *chronic ulcerative colitis* is detailed on page 191.

Food allergy at times occurs in the diabetic patient. When obvious sensitizations exist, the foods responsible may be excluded, and similar foods substituted so that no nutritional damage results In a diabetic, when food allergy is suspected as a cause of bronchial asthma, eczema, gastro-intestinal symptoms or sick headaches, the diabetic diet must be chosen from the foods in the elimination diet selected for purposes of diagnostic study. A typical diet of this type is detailed on page 194. Similar diets according to the patient's diabetic tolerance and to his possible or definite food allergies can be arranged. The writer has studied several diabetics, especially children, who had recurrent acidosis and threatened coma due to cyclic vomiting. As noted on page 131, evidence stresses that such vomiting is frequently due to food allergy, and sometimes is a forerunner of sick headaches or recurrent migraine in later life To prevent recurrent vomiting, acidosis, and possible coma in these diabetics, the indicated elimination diet often has to be continued according to the patient's carbohydrate tolerance for several months or possibly years Some patients have been relieved by the exclusion from their diabetic diets of various foods found by diet trial to be responsible for their allergies.

Obese patients often ...
intestinal or other ...
as a possible caus ... headaches, migraine and toxic symptoms may be associated with obesity. Along with weight reduction, the study of possible food allergy is indicated in these patients. For this purpose, various reducing and elimination diets with detailed menus have been arranged as printed on page ...
or other supplemental type of ...
on page 147, special menus mus...
foods and the number of calori...
times, nutrition must be prote... page 140).

Suggested Menu—(Continued)

LUNCH OR DINNER

Vegetables:

Lettuce, tomato, spinach, chard, carrots, squash, asparagus, peas, artichokes, beets, string beans, and lima beans. (Prescribed oil, lemon and salt only may be used.)

Potatoes:

White or sweet, or yams, boiled, baked, or fried only in proper oil.

Jams or Jellies:

As at breakfast.

Bread:

Bread, cookies, and other bakery products as at breakfast.(10-19)

Fruit:

As at breakfast.

Beverages:

Pineapple, grapefruit, apricot, peach, pear, or tomato juice.

Comments. 1. The directions for the use of this elimination diet as summarized on page 151 and discussed in Chapter V must be accurately followed.

2. Grapefruit juice, preferably fresh, can be obtained in most areas. The amount prescribed assures sufficient vitamin C intake for the day. Other prescribed fruit juices or tomato juice may be taken. If grapefruit juice is not available, additional vitamin C may be required.

3. Ry-Krisp (Ralston) contains only rye flour and salt. Any other bread or bakery product must be brought by the patient to the meal and must be made at home or by honest, supervised bakers as discussed on page 138 from recipes in this book.

4. No restaurant or hotel made, or canned soups can be taken since they contain pepper, varying spices, and other forbidden foods.

5. Meats, vegetables, and potatoes must be cooked plain without butter, milk, or pepper. Salt may be added by the patient. Sesame or soy bean oil should be brought in a stoppered bottle to meals. Possible adulterants in commercial salad oils are difficult to detect and to identify

6. The patient must not eat or taste any food suspected of containing any food, flavor, coloring or spice not allowed on his diet.

7. Clean spoons and cooking utensils as advised on page 139 are imperative.

8. The physician must supervise the accurate execution of this diagnostic trial diet as discussed on page 140.

Fruit-free Elimination Diets 1, 2 and 3, and Fruit-free, Cereal-free Elimination Diets 1, 2 and 3

(EATEN AWAY FROM HOME)

Menus for these diets are similar to those outlined on pages 168 to 172. The physician, dietitian, or patient, should write out the diet to be followed. The advice and precautions given in the former menus as well as in the diets, for hotels, restaurants, etc., on pages 173 to 174 are important and must be followed.

Since fruits are excluded from these diets, more of the tapioca cooked with sugar (see page 156), more of the vegetables and potatoes and allowed bakery products will be required as stressed in the fruit-free menus on pages 168 to 172. Proper nutrition, vitamin intake, and weight must be maintained.

Cereal-free Elimination Diet for Infants (Rowe)

Soy Bean Cereal-Free Formula (see directions, page 183).
Mull-Soy (Borden Company).
[illegible]

Sobee cooked with water for one-half hour may be used as a cereal. It contains
[illegible]

For vitamin A, give Caritol in sesame oil, 8 to 10 drops daily.
For vitamin B_1 and other B vitamins, give in feedings the contents of ¼ to ½ B-complex capsule each day according to infant's age
For vitamin C, give cevitamic acid, 50 mg. daily.
For vitamin D, give Viosterol in sesame oil or Drisdol, 6 to 10 drops daily.

Cod-liver oil may be tried at any age after relief of allergic symptoms occurs. If *no allergy is* evident, it may be used in place of Caritol and Viosterol or Drisdol.
Adequate calcium and phosphorus are contained in the soy bean preparations.

To the initial elimination diet, the following foods should be added according to the infant's age, desire, and digestive and allergic *tolerance:*
Grapefruit juice, sweetened, from the first to the third month.
Tomato juice
Puréed [illegible]

Scraped or finely minced lamb or beef and also bacon, from the sixth to the tenth month. Strained meats (Clapp & Co) are desirable.
Salt, cane or beet sugar, and sesame oil may be used.

After relief of allergic symptoms is definite, the following foods may be added, one every five to ten days:
Orange, lemon [illegible]
late [illegible]
Eggs, cho [illegible]
yea [illegible]

Comments. The directions for the use of the elimination diet printed on page 151 should be read carefully. The use of clean utensils and dishes is important. As foods are added, their possible allergenic effect should be studied and, if symp-

Gout and food allergy occasionally have been associated in the writer's patients. The elimination diet which controls the food allergy must also exclude those foods which are high in purins. A patient was seen who had painful swellings in feet, ankles, wrists, and a few other joints, which were not only due to synovial membrane allergy, but also to gout. Some students have suggested that gout is due to food allergy, but the experience of many others, including the writer, has not substantiated this idea.

The major cause of *acne vulgaris* seems to be an epidermal lipoidosis with a varying degree of secondary pustular infection. Evidence suggests, however, that allergy to drugs and to specific foods may produce or exaggerate acneform lesions. Therefor the writer assumes food allergy along with a perverted ability to handle fats and uses his elimination diets devoid of practically all fat as recommended on page 118.

ELIMINATION DIETS FOR INFANTS AND YOUNG CHILDREN

Certain children are relieved of allergic manifestations by the exclusion of foods to which aversions or obvious disagreements exist, or to which definite scratch reactions occur. However, since false positive or negative reactions often are obtained, as discussed on page 13, elimination diets become necessary for the adequate study of possible food sensitizations.

Until symptoms are relieved, it is best in nearly every case to exclude foods which commonly produce allergy, namely milk, egg, wheat, orange, banana, apple, fish, nuts, and several others. Because of the presence of group or specific allergens in cereal grains other than wheat, they also are excluded.

During the initial study of possible food allergies, a maximum degree of allergy to all excluded foods must be assumed and their elimination must be complete. After relief is assured, the degree of exclusion of the allergenic foods will depend on the degree of allergy to those foods as determined by trial feeding.

To meet the protein requirements, soy bean preparations should be used, especially in infants. The soy milk formula, as printed on page 183, contains the comparable amounts of protein, calcium, phosphorus, and calories as an equal quantity of cow's milk. Sobee is a powder containing such ingredients and which may be added to water to make a milk substitute. If it is accurately prepared, it is agreeable, and comparable to canned preparations but it is less expensive. Mull-Soy, diluted with an equal amount of water, and undiluted Kreme O'Soy are commercial canned preparations of soy milk. The possible use of Cemac or the

the Infant Diet.

be modified according to

enlarged

foods according to recurring symptoms.

Lunch or Dinner

Soup:
Beef or lamb broth—no pepper or onion—thickened with tapioca, potato starch flour, or with a split pea puree. Vegetables listed in this diet may be added, and soup may be salted to taste. (No canned soups allowed.) May be made with strained meats (Clapp & Co.).

Meat:
Beef or lamb—chops, steak, hot or cold roast, cooked in their own fat or in soy bean or sesame oil.
Minced, ground or strained (Clapp & Co.) beef or lamb.
Chicken—friers or broilers (no hens). Rub and cook with soy or sesame oil only.

Vegetables:
[illegible]
bean oil, and salt.)

Bread:
Soy-potato or soy-lima-potato bread or muffins as at breakfast.(4)(5)(8)

Butter Substitutes:
As at breakfast.

Dessert:
Tapioca cooked with pears, peaches, apricots and prunes, and sugar.(1)
Soy-potato pudding (8–f)
Soy or soy-potato cake or cookies (8)
Canned pears, peaches or apricots. Fresh peeled fruit if ordered by physician.
Jello or gelatin containing prescribed fruits or their flavors.

Soy Bean Cereal-Free Formula, Mull-Soy, or Kreme O'Soy—1 glassful.

Instructions and Diet Suggestions

1. The directions for the use of elimination diets as summarized on page 151 and discussed in Chapter V must be accurately followed. Numbers in menus refer to recipes (page 232). The effect of the war on the elimination diets is discussed on page 152.

2. Give as much of all the foods with meals, and if desired between meals, as tolerated

3. Weigh every two days. If weight loss occurs, give 1 to 2 teaspoonfuls of soy or sesame oil between meals and more butter substitute or oil on the vegetables, more tapioca, potato, bread, cookies, jam, sugar, and maple syrup to increase calories.

4. Give meat or fowl twice a day and bacon once a [illegible] Strained [illegible]

5. [illegible] No d [illegible] diet should be given Foods must be served on clean plates, cooked in clean utensils. Do not stir child's food with a spoon that has touched a forbidden food like milk, egg, or butter without washing the spoon first.

6. If n [illegible] table, fru [illegible] bread an [illegible]

7. If adequate Soy Bean Cereal-Free Formula (see page 183), Mull-Soy, Kreme O'Soy or Sobee is not taken, then give 1 teaspoonful of dicalcium phosphate in ½ glass of water or in divided doses in the food through the day to satisfy calcium requirements.

toms recur, the causative foods should be eliminated (see page 144). After the allergenic foods are determined, the necessity of their continued total or partial exclusion will depend on the degree of allergy.

Cereal-free Elimination Diet After the First Year—(Rowe)

The amounts, ingredients, and preparation must vary according to the age, food allergies, food aversions, and digestive tolerance.

Foods Allowed

Soy Bean Cereal-Free Formula (see directions, page 183).
Mull-Soy (Borden Company) (diluted with equal amount of water).
Kreme O'Soy (Madison Foods, Madison College, Tenn.) (undiluted).
Sobee (Mead Johnson & Co), 6 tablespoonfuls in 7 ounces of water boiled for three minutes with added cane sugar or Dextri-Maltose as tolerated.
Almond milk (see page 199).

Tapioca	String beans	Grapefruit
White potato	Lima beans	Lemon
Sweet potato	Artichokes	Peaches
Soy bean flour	Asparagus	Pears
Lima bean flour	Tomato	Apricots
		Prunes
Spinach	Lamb	
Chard	Beef	Salt
Carrots	Bacon	Maple syrup (Log Cabin)
Beets	Chicken (no hens)	Sesame oil
Peas		Soy bean oil

The Soy Bean Cereal-Free Formula, Mull-Soy or Kreme O'Soy may be used as such in a soup, or diluted, hot or cold, sweetened if desired, and served throughout the day as a beverage. These contain all the important ingredients, including calcium, phosphorus and protein, found in milk. Sobee cooked for one-half hour may be used as a cereal. The soy bean cereal-free formula prepared with less water flavored if desired with vanilla with extra sugar can be fed as a cereal or a dessert. Split pea purée, salted to taste and flavored with a little bacon may also be used [illegible] lement [illegible]

BREAKFAST

Beverage:
Grapefruit juice with sugar, or
Tomato juice (non-seasoned).

Cereal Substitute:
Tapioca cooked with pears, peaches, apricots or prunes, and sugar.
Soy-potato starch pudding.(8-f)

Bread:
Soy-potato or soy-lima-potato bread or muffins made only according to recipes in this book.(4)(5)(8)

Butter Substitute:
Soy bean or sesame oil with salt, bacon grease, jam, jelly or maple syrup on bread

Jams or Preserves:
Made from prescribed fruits and sugar, carrot marmalade, or tomato preserves allowed.(22)(23)(24)

Meat:
Bacon, as such, if desired.

Soy Bean Cereal-Free Formula, Mull-Soy or Kreme O'Soy, 1 glassful.

Soy Bean Cereal-free Formula with Full Fat Soy Flour

	Measure	Gm.	C., gm	P., gm	F., gm.	Cal.	Ca. gm.	P. gm.	Fe. gm.	NaCl, gm.
Soy bean flour* full fat	18 Tbsp.	80 00	17.2	32.0	17.6	335.2	0.224	0.480	0.0160	0.238
Potato starch flour† 83% carb	3½ tsp.	12 00	10.0	..	..	40 0	..	..	..	..
Sugar	5½ tsp.	21 00	21 0	..	..	84 0	..	..	..	..
Soy bean oil	2 Tbsp.	20 40	..	..	20 4	183.6	..	..	..	..
Dicalcium phosphate	1 tsp.	4 00	..	..	..	..	0 900	0 700	..	..
Salt	¼ tsp.	1 39	..	..	..	..	..	..	..	1.392
Water to make 32 oz	4 cups									
			48 2	32 0	38 0	662.8	1.124	1.180	0 0160	1.680
This is the equivalent of whole cow's milk.										
Whole milk	4 cups	960 00	48 0	31.6	38.0	660.0	1 120	0 893	0 00192	1.680

* Orangeblossom Soy Flour (Archer-Daniels-Midland Co., Minneapolis, [illegible]

Soy Bean Cereal-free Formula with Low Fat Soy Flour

	Measure	Gm	C., gm.	P., gm	F., gm	Cal.	Ca. gm.	P. gm.	Fe. gm.	NaCl, gm.
Soy bean flour* low fat	11 Tbsp.	63.00	20 0	32.0	1.9	255 1	0.210	0 390	0 0126	0.227
Potato starch flour, 83% carb.	3½ tsp.	12 00	10 0	..	..	40 0	..	..	..	..
Sugar	4½ tsp.	18 00	18 0	..	..	72.0	..	..	..	..
Soy bean oil	3½ Tbsp.	36 00	..	..	36.0	324 0	..	..	..	..
Dicalcium phosphate	1 tsp	4 00	..	..	..	..	0.900	0 700	..	..
Salt	¼ tsp	1.39	..	..	..	..	..	..	..	1.390
Water to make 32 oz.	4 cups									
			48 0	32.0	37 9	661.1	1.110	1.090	0.0126	1.617
Whole milk	4 cups	960.00	48 0	31.6	38 0	660 0	1.120	0 893	0 00192	1.680

* Nutrisoy Flour No 1 of Archer-Daniels-Midland Co., Minneapolis, Minn., or Staley's Soy Flour No 2 (A. E Staley Manufacturing Co., Decatur, Ill) are low fat processed flours which make a satisfactory emulsion.

HOMOGENIZED STRAINED MEATS IN INFANTS' FORMULÆ AND DIETS AND IN INVALIDS' DIETS

For the last three years the writer has used canned, finely divided, liquefied meats to supply the protein requirements of some milk-sensitive infants and young children who have an allergy or digestive intolerance

8. Give cevitamic acid, 50 mg. once or twice daily, according to the amount of vitamin C in the fruits and vegetables taken.

9. Give Viosterol (Abbott) or Drisdol, 8 to 10 drops daily in food to assure adequate vitamin D intake. With adequate sun exposure, this vitamin may be omitted. [illegible] thereto. [illegible] of Drisdo [illegible]

10. Give thiamin, 2 mg. daily, to assure adequate vitamin B_1 intake. Other synthetic B vitamins *may be desirable.*

11. After relief of allergy is definite, the following foods can be tried, one every five to seven days: rice, corn, orange, pineapple, apple, banana, cow's milk (at first [illegible] other [illegible] as mil[illegible] or months. Any foods which produce immediate or delayed recurrences of allergy must be excluded.

SOY BEAN CEREAL-FREE FORMULÆ

The soy bean milk made with these formulæ contains approximately the same amounts of carbohydrate, protein, fat, calories, calcium, phosphorus, iron, and salt as does cow's milk. It is similar in composition to the commercial canned products Mull-Soy, Kreme O'Soy, but it is much less expensive.

Two formulæ are offered. The first uses full fat processed flours and is *preferable* to the second which uses a low fat flour. Potato starch flour is used in place of tapioca or arrowroot flour because of its easy availability and lower cost. The changes in the amounts of the constituents in the formulæ as compared with that in the former edition of this book are due to the latest analyses of the recommended processed flours. A simplified method of preparation of the formulæ also has been developed.

Some infants and especially children will drink the formula only when flavored with vanilla and when more sugar is added. Some will take with *a spoon a thick formula made with less water (one-half or two-thirds the* usual amount). Vanilla and extra sugar appeals to some children.

Since the recommended amount of calcium is advisable, it should be mixed with the amount of the formula taken during the day. Or it may be omitted from the formula and taken in water, flavored with vanilla and sugar if necessary or mixed with a food of two different meals (see page 141).

Method of Preparation. All measurements are level. *Use standard measuring cups, tablespoons (Tbsp.) and teaspoons (tsp). Level off the spoon, after filling, with the blade of a knife. Sift the soy bean flour once before measuring and do not pack into the cup.*

Mix the soy bean flour, sugar, and salt in 3½ cups of water. Heat to the boiling point in the top of a double boiler. Add the oil. Mix the potato starch flour and dicalcium phosphate in ½ cup of cold water and stir it into the boiling liquid. Cook for 45 minutes over boiling water stirring occasionally to prevent lumping. If necessary add water to allow for evaporation.

(The commercial companies furnished the values for the carbohydrate, protein and fat content of their own soy bean flours.)

(Adapted from the Formula of Katherine Bane, M.D., and Miriam Lowenberg.)

Soy Bean Cereal-free Formula with Full Fat Soy Flour

	Measure	Gm	C., gm.	P., gm.	F., gm.	Cal.	Ca. gm.	P. gm.	Fe. gm.	NaCl. gm.
Soy bean flour* full fat	13 Tbsp	80 00	17.2	32 0	17.6	335.2	0.224	0 480	0 0160	0.288
Potato starch flour† 83% carb	3½ tsp	12 00	10.0	..	..	40 0	..	..	..	..
Sugar	5¼ tsp	21 00	21.0	..	..	84.0	..	..	..	..
Soy bean oil	2 Tbsp.	20 40	..	..	20 4	183.6	..	..	..	..
Dicalcium phosphate	1 tsp	4 00	..	..	..	..	0.900	0 700	..	..
Salt	¼ tsp.	1.39	..	..	..	..	..	..	..	1.393
Water to make 32 oz.	4 cups									
			48.2	32 0	38.0	662.8	1.124	1.180	0.0160	1.680
This is the equivalent of whole cow's milk. Whole milk	4 cups	960 00	48 0	31.6	38 0	660 0	1.120	0 893	0 00192	1.680

* Orangeblossom Soy Flour (Archer-Daniels-Midland Co [illegible]

Soy Bean Cereal-free Formula with Low Fat Soy Flour

	Measure	Gm.	C., gm.	P., gm.	F., gm.	Cal.	Ca. gm.	P. gm.	Fe. gm.	NaCl. gm.
Soy bean flour* low fat	11 Tbsp	63.00	20 0	32 0	1.9	255 1	0 210	0 390	0.0126	0.227
Potato starch flour, 83% carb.	3¼ tsp	12 00	10 0	..	..	40 0	..	..	..	..
Sugar	4½ tsp.	18 00	16 0	..	..	72 0	..	..	..	..
Soy bean oil	3½ Tbsp.	36 00	..	..	36.0	324 0	..	..	..	..
Dicalcium phosphate	1 tsp.	4 00	..	..	..	..	0 900	0.700	..	..
Salt	¼ tsp.	1 39	..	..	..	..	..	..	..	1.390
Water to make 32 oz.	4 cups									
			48.0	32 0	37.9	661.1	1.110	1 090	0 0126	1.617
Whole milk	4 cups	960 00	48 0	31.6	38 0	660 0	1.120	0 893	0 00192	1.680

* Nutrisoy Flour No 1 of Archer-Daniels-Midland Co, Minneapolis, Minn., or Staley's Soy Flour No 2 (A. E Staley Manufacturing Co, Decatur, Ill) are low fat processed flours which make a satisfactory emulsion.

HOMOGENIZED STRAINED MEATS IN INFANTS' FORMULÆ AND DIETS AND IN INVALIDS' DIETS

For the last three years the writer has used canned, finely divided, liquefied meats to supply the protein requirements of some milk-sensitive infants

for legumes, particularly for soy beans. Such canned meat products soon will become available commercially (Clapp & Co.).

1. In young infants, these strained meats can supply the protein in a formula for bottle feeding similar to the one the writer published in 1931. This formula furnishes carbohydrate, protein, fat, and minerals comparable to those existing in mother's milk. It can be diluted if the infant's age so indicates. Either strained lamb or beef may be utilized. Dextri-Maltose can be substituted for cane sugar and Mazola or olive oil for sesame oil if allergy to these is not probable. Rice flour or cornstarch, if allergy to them is unlikely, can be substituted for tapioca or potato flour.

Such a formula offers advantages over that proposed by Cohen and co-workers in 1933, sold as "Cemac," which contains homogenized beef, cauliflower, tomato, carrot, spinach, cane sugar, dextri-maltose, olive oil, cod-liver oil, gelatin, dicalcium phosphate, sodium acid phosphate and water. Whereas Cemac contains these specified vegetables, beef, olive and cod-liver oils, our present formula contains no vegetables, a *choice of lamb or beef, of tapioca or potato flour, and a choice of oils.* Thus when milk allergy is suspected or present and soy bean milk cannot be taken, this formula can replace such soy bean milk in the elimination diet for infants (see page 179). Vitamins, specified vegetables, and other foods can be fed according to the nutritional requirements and the age of the infant as advised on page 204, being added to the formula or given separately. These liquified meats, therefor, allow the preparation of the infant's formula and the rest of his diet according to the possibilities of allergy and the nutritional requirements of the patient. This formula can be diluted if indicated by the infant's age, as is customary with cow's milk.

Substitute Formula for Cow's Milk Containing Strained Homogenized Meat

	Wt., gm.	*Measure*	Carb.	Prot.	Fat	Cal	Ca, gm.	P, gm.	Fe, gm.	Cl as NaCl, gm.
Strained lamb, 12.23% P., 11.17% F.	270.00	1½ cups		33 gm.	30 gm.	402	0.11	2.07	0.015	
or										
[illegible]	[illegible]	[illegible]								
[illegible]					10 gm	90				
[illegible]						120				
Potato starch flour, [illegible]						80				
or										
Tapioca flour, 88% C.	23.00									
Calcium carbonate	3.00	1 tsp.					1.20			
NaCl	1.75	½ tsp.								1.75
Water—q.s. 1000 cc.		4½ cups								
	Total for	or 1000 cc.	50 gm.	33 gm.	40 gm.	692	1.31	2.07	0.015	1.75
	or for	100 cc.	5%	3.3%	4%	69.2%	0.131	0.207	0.0015	0.175
This is the equivalent of whole cow's milk:										
Whole milk (Sherman and Bridges)			5%	3.3%	4%	69	0.120	0.093	0.00024	0.175
Human milk (Bridges)			6.5%	1.5%	3.3%	61.7%	0.040	0.010	0.00015	0.058

Method of preparation: All measurements are level, using standard measuring cups and spoons. Heat water to boiling in the top of a double boiler. Add sugar, salt, and calcium carbonate. Mix the potato starch or tapioca flour to a paste [illegible]

2. These strained meats can be used in place of minced or ground meats when such are indicated in later infancy and young childhood. Being pre-cooked and sterile, they may be better tolerated and more digestible than home cooked minced meats. They may be fed as such or combined with specified, puréed vegetables or with cooked potato or tapioca in a thick mixture or thinned with a pure beef or lamb broth as a soup, being salted to taste.

3. Obviously these strained liquified meats may be fed to older children and adults who require meat protein and who are unable to chew, swallow, or digest ordinary meat. Those, who because of weakness or disease, require liquid, soft, or puréed nourishment, especially when milk allergy exists, can obtain their protein requirements with these strained meats. When feeding through a gastric, duodenal or intestinal tube is necessary, liquified strained meats may be important for protein nutrition.

REDUCTION DIETS FOR PATIENTS WITH DEFINITE OR POSSIBLE FOOD ALLERGIES

As noted previously on page 178, many obese or overweight patients are affected with symptoms due to definite or possible food allergies. For them, *not* only a low calorie diet with adequate protein content is necessary, but such a diet must be selected from the elimination diet chosen for diet trial by the physician.

Such diets, selected from foods in Cereal-free Elimination Diet 1, 2 and 3, and also in Elimination Diet 1 and 2 are detailed below.

Reducing Diets—Cereal-free Elimination Diet 1, 2 and 3 (Rowe)

Foods Allowed According to Menus Below

Tapioca	Carrots	Salt
White potato	Beets	Soy bean oil
Sweet potato or yam	Artichoke	Sesame oil
Soy-potato bread or muffin	Tomato	Gelatin, plain
Soy-lima-potato bread or muffin	Squash	Lime, lemon or pineapple flavored gelatin
	Asparagus	
	Peas	
	String beans	
Lamb	Lima beans	White vinegar
Beef		Vanilla extract
Chicken	Lemon	Lemon extract
Bacon	Grapefruit	
	Pears	Royal baking powder
Lettuce	Pineapple	Baking soda
Spinach	Peaches	Cream of tartar
Chard	Apricots	Saccharine

Suggested Menu—500 Calories

Breakfast· *Approximate*

Grapefruit juice

Suggested Menu—500 Calories—(Continued)

	Approximate amounts
Lunch:	
Clear lamb, beef or chicken broth (not canned)	1 cup
Lean lamb, beef or chicken—measure edible portion of cooked meat	¼ lb. scant
One vegetable from Group 1 (use lemon juice or white vinegar and salt on salads)	
One vegetable from Group 2	Amt. specified
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb, beef, or chicken broth (not canned)	1 cup
Lean lamb, beef, or chicken—measure edible portion of cooked meat	¼ lb. scant
Two vegetables from Group 1 (or one double portion) (use lemon juice or white vinegar and salt on salads)	*Amt. specified*
Two vegetables from Group 2	Amt. specified
One fruit from Group 3	Amt. specified

This menu contains approximately 500 calories.

Carbohydrate	41 gm.	Ca	0.313 gm.
Protein	62 gm.	P	0.898 gm.
Fat	10 gm.	Fe	0.166 gm.

Suggested Menu—750 Calories

	Approximate amounts
Breakfast:	
Grapefruit juice	½ cup
Soy-lima-potato bread or muffin (4, 5)	1 slice 3 x 4 x ½"
Bacon—crisp	4 slices
Lunch:	
Clear lamb, beef, or chicken broth (not canned)	1 cup
Lean lamb, beef or chicken—measure edible portion of cooked meat	2½ oz.
One vegetable from Group 1 (use lemon juice or white vinegar and salt on salads)	Amt. specified
One vegetable from Group 2	Amt. specified
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb, beef or chicken broth (not canned)	1 cup
Lean meat—measure edible portion after cooking	¼ lb.
Two vegetables from Group 1 (or one double portion) (use lemon juice or white vinegar and salt on salads)	Amt. specified
Two vegetables from Group 2 (or one double portion)	Amt. specified
Soy-lima-potato bread or muffin (4, 5)	1 slice 3 x 4 x ½"
Soy bean or sesame oil	1 level tsp.
One fruit from Group 3	Amt. specified

This menu contains approximately 750 calories.

Carbohydrate	53 gm.	Ca	0.337 gm.
Protein	69 gm.	P	0 935 gm.
Fat	29 gm.	Fe	0.015 gm.

Suggested Menu—1000 Calories

	Approximate amounts
Breakfast:	
Grapefruit juice	½ cup
Bacon—crisp	4 strips
Soy-lima-potato bread or muffin (4, 5)	1 slice 3 x 4 x ½"
Lunch.	
Clear lamb, beef, or chicken broth (not canned)	1 cup
Lean lamb, beef, or chicken—measure edible portion after cooking	2½ oz.
One vegetable from Group 1 (use lemon juice or white vinegar and salt on salads)	Amt. specified
Two vegetables from Group 2	Amt. specified
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb, beef, or chicken broth (not canned)	1 cup
Lean lamb, beef or chicken	¼ lb. scant
White potato	1 med.
Two vegetables from Group 1 (use lemon juice or white vinegar and salt on salads)	Amt. specified
One vegetable from Group 2	Amt. specified
Soy-lima-potato bread or muffin (4, 5)	1 slice 3 x 4 x ½"
Soy bean or sesame oil	1 level tsp.
One fruit from Group 3	Amt. specified

This menu contains approximately 1000 calories.

Carbohydrate	103 gm.	Ca	0.350 gm.
Protein	72 gm	P	0 988 gm.
Fat	34 gm.	Fe	0.016 gm.

Vegetables and Fruits

(Measured after cooking)

Group 1:	
Spinach—fresh, cooked or canned	½ cup
Chard—cooked	½ cup
Asparagus—cooked	6 stalks
Squash—cooked	½ cup
Lettuce—4 large leaves or ½ med head	
Group 2:	
Carrots—cooked	⅓ cup
Beets—cooked	½ cup
Artichoke—fresh cooked	1 medium
Artichoke—canned	4 small hearts
Tomato—fresh	1 med.
Tomato—canned	½ cup
Tomato—juice	⅓ cup
Squash—cooked	½ cup
Green peas—cooked	½ cup
String beans—cooked	½ cup
Green lima beans—cooked	2 Tbsp.
Group 3:	
Grapefruit—fresh	½ small 3½" diam.

Suggested Menu—500 Calories—(Continued)

	Approximate amounts
Lunch:	
Clear lamb, beef or chicken broth (not canned)	1 cup
Lean lamb, beef or chicken—measure edible portion of cooked meat	¼ lb. scant
One vegetable from Group 1 (*use lemon juice or white vinegar* and salt on salads)	
One vegetable from Group 2	*Amt. specified*
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb, *beef, or chicken broth (not canned)*	*1 cup*
Lean lamb, beef, or chicken—measure edible portion of cooked meat	¼ lb. scant
Two vegetables from Group 1 (or one double portion) (use lemon juice or white vinegar and salt on salads)	Amt. specified
Two vegetables from Group 2	Amt. specified
One fruit from Group 3	Amt. specified

This menu contains approximately 500 calories.

Carbohydrate	41 gm.	Ca	0.313 gm.
Protein	62 gm.	P	0.898 gm.
Fat	10 gm.	Fe	0.166 gm.

Suggested Menu—750 Calories

	Approximate amounts
Breakfast:	
Grapefruit juice	½ *cup*
Soy-lima-potato bread or muffin (4, 5)	1 slice 3 x 4 x ½"
Bacon—crisp	4 slices
Lunch:	
Clear lamb, beef, or chicken broth (not canned)	1 cup
Lean lamb, beef or chicken—measure edible portion of cooked *meat*	2½ oz.
One vegetable from Group 1 (use lemon juice or white vinegar and salt on salads)	Amt. specified
One vegetable from Group 2	Amt. specified
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb, beef or chicken broth (not canned)	1 cup
Lean meat—measure edible portion after cooking	¼ lb.
Two vegetables from Group 1 (or one double portion) (use lemon juice or white vinegar and salt on salads)	Amt. specified
Two vegetables from Group 2 (or one double portion)	Amt. specified
Soy-lima-potato bread or muffin (4, 5)	1 slice 3 x 4 x ½"
Soy bean or sesame oil	1 level tsp
One fruit from Group 3	Amt. specified

This menu contains approximately 750 calories.

Carbohydrate	53 gm.	Ca	0.337 gm.
Protein	69 gm.	P	0.935 gm.
Fat	29 gm.	Fe	0.015 gm.

Suggested Menu—500 Calories

	Approximate amounts
Breakfast.	
Grapefruit juice	½ cup
Lunch:	
Clear lamb or chicken broth (not canned)	1 cup
Lean lamb or chicken—measure only edible portion of cooked meat	¼ lb.
One vegetable from Group 1 (use lemon juice or white vinegar on salad)	Amt. specified
One vegetable from Group 2	Amt. specified
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb or chicken broth (not canned)	1 cup
Lean lamb or chicken—measure only edible portion of cooked meat	¼ lb.
Two vegetables from Group 1 or one double portion (use lemon juice or white vinegar on salad)	Amt. specified
Two vegetables from Group 2 or one double portion	Amt. specified
One fruit from Group 3	Amt. specified
Lemonade with saccharine	

This menu contains approximately 500 calories.

Carbohydrate	46 gm.	Ca	0 315 gm.
Protein	60 gm.	P	0.900 gm.
Fat	9 gm	Fe	0.017 gm.

Suggested Menu—750 Calories

	Approximate amounts
Breakfast:	
Grapefruit juice	½ cup
Ry-Krisp	2 wafers
Bacon—crisp	4 slices
Lunch:	
Clear lamb or chicken broth (not canned)	1 cup
Lean lamb or chicken—measure only edible portion of cooked meat	¼ lb.
One vegetable from Group 1 (use lemon juice or white vinegar and salt on salads)	Amt. specified
One vegetable from Group 2	Amt. specified
Ry-Krisp *or*	2 wafers
Rice, corn or rye bread or muffins (10–16)	
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb or chicken broth (not canned)	¾ cup
Lean lamb or chicken—measure only edible portion of cooked meat	¼ lb
Two vegetables from Group 1 or one double portion (use lemon juice or white vinegar and salt on salads)	Amt. specified
Two vegetables from Group 2 or one double portion	Amt. specified
Ry-Krisp *or*	2 wafers
Rice, corn, or rye bread or muffins(10–16)	
One fruit from Group 3	
Lemonade with saccharine	Amt. specified

Vegetables and Fruits—(Continued)

(Measured after cooking)

Group 3:	*Approximate amounts*
Grapefruit—canned without sugar	⅓ cup
Grapefruit—juice canned without sugar	¼ cup
Pears—fresh	1 small
Pears—canned in water	2 halves
Pineapple—fresh, diced	½ cup
Pineapple—canned in water	1 small slice
Pineapple—juice, not sweetened	¼ cup
Peaches—fresh	1 small
Peaches—canned in water	2 halves
Apricots—fresh	2 whole
Apricots—canned in water	2 whole
Gelatin—lemon, lime or pineapple	*4 level Tbsp.*
D-Zerta—lemon or lime, may be used as desired	

Comments. The suggestions and directions about the preparation of the elimination diets as summarized on pages 151 and 152 should be followed. Broths (not canned) should be made from plain meats, with no condiments, pastes, or other ingredients except salt and prescribed vegetables. Only fresh or water-packed specified fruits are permitted. No trace of any food not included in the elimination diet is allowable. Recipes for bakery products are on page 232. Standardized cups and spoons must be used to measure all foods.

To assure calcium balance, *3 teaspoonfuls* of calcium gluconate or *1 teaspoonful* of calcium carbonate should be taken daily in water. Viosterol in sesame oil, 12 to 15 drops, is necessary if exposure to the sun or ultra-violet light is not possible. Additional vitamin therapy is required, especially with low calorie diets (see page 140).

The effect of the war *on the elimination diets is discussed on page 152.*

Reducing Diets—Elimination Diet 1 and 2 (Rowe)

Foods Allowed According to Menus Below

Rice
Corn
Rye
Tapioca
Sweet potato or yam

Rice biscuit
Rice bread
Corn pone
Corn-rye muffins
Rye bread
Ry-Krisp

Lemon
Grapefruit
Pears

Pineapple
Peaches
Apricots
Prunes

Lamb
Chicken (no hens)
Bacon

Lettuce
Chard
Spinach
Carrots
Beets
Squash
Asparagus
Artichoke

Saccharine
Salt
Mazola oil
Gelatin, plain
Lime, lemon or pineapple flavored gelatin
White vinegar

Vanilla extract
Lemon extract
Royal baking powder
Baking soda
Cream of tartar

	Approximate amounts
Group 2:	
Carrots—cooked	½ cup
Beets—cooked	½ cup
Artichoke—fresh cooked	1 medium
Artichoke—canned	4 small hearts
Squash—cooked	½ cup
Group 3:	
Grapefruit—fresh	½ small 3½″ diam.
Grapefruit—canned without sugar	½ cup
Grapefruit juice—canned without sugar	½ cup
Pears—fresh	1 small
Pears—canned in water	2 halves
Pineapple—fresh, diced	½ cup
Pineapple—canned in water	1 small slice
Pineapple juice—not sweetened	½ cup
Peaches—fresh	1 small
Peaches—canned in water	2 halves
Apricots—fresh	2 whole
Apricots—canned in water	2 whole
Gelatin—lemon, lime or pineapple flavored	4 level Tbsp.
D-Zerta—lemon or lime—may be used as desired	

Comments. Similar diets containing the same amounts of carbohydrate, protein and fat may be arranged from other foods in Elimination Diets 1 and 2 (see page 159)

[illegible]

prescribed vegetables should be used. No trace of any food not included in these elimination diets is allowable. Standardized cups and spoons must be used to measure all foods.

The effect of the war on the elimination diets is discussed on page 152.

ELIMINATION DIET FOR CHRONIC ULCERATIVE COLITIS OR POSSIBLE ALLERGIC COLITIS

As discussed on page 121, *food allergy must be considered as one of the possible causes of chronic ulcerative colitis.* Evidence indicates that allergy to milk is most frequent but that allergy to wheat, egg, corn, rice, chocolate, fruits, and various vegetables also occurs. For the study of possible food allergy in these cases, a modified fruit- and cereal-free elimination diet (see page 192) may be used It may be prepared in liquid, soft, puréed or minced form, until diarrhea is relieved. Foods to which definite scratch skin reactions, or definite dislikes or apparent idiosyncrasies exist should be suspected of causing allergy. They may be eliminated from the diet or replaced by similar foods. The skin reaction, however, has been of little help in our cases. If intolerance or allergy to legumes is probable, rice or additional potato, tapioca and sugar may be used to

Suggested Menu—750 Calories—(Continued)

	Approximate amounts
Dinner:	

This menu contains approximately 750 calories.

Carbohydrate	70 gm.	Ca	0.340 gm.
Protein	75 gm.	P	0.926 gm.
Fat	19 gm.	Fe	0.016 gm.

Suggested Menu—1000 Calories

Breakfast:	
Grapefruit juice	½ cup
Ry-Krisp *or*	2 wafers
Corn, rice or rye bread or muffin(10–16)	
Bacon—crisp	4 slices
Lunch:	
Clear lamb or chicken broth (not canned)	1 cup
Lean lamb or chicken—measure only edible portion of cooked meat	¼ lb.
One vegetable from Group 1 (use lemon juice or white vinegar and salt on salads)	Amt. specified
Two vegetables from Group 2 or one double portion	Amt. specified
Ry-Krisp *or*	2 wafers
Corn, rice or rye bread or muffin(10–16)	
Soy bean or sesame oil	1 level tsp.
One fruit from Group 3	Amt. specified
Lemonade with saccharine	
Dinner:	
Clear lamb or chicken broth	1 cup
Lean lamb or chicken—measure only edible portion of cooked meat	¼ lb.
Corn or canned corn	1 med. ear or ½ cup
Rice—steamed	1 heap. Tbsp.
Two vegetables from Group 1 or one double portion (use lemon juice or white vinegar and salt on salads)	Amt. specified
One vegetable from Group 2	Amt. specified
Ry-Krisp *or*	1 wafer
Corn, rice or rye bread or muffin(10–16)	
Soy bean or sesame oil	1 level Tbsp.
One fruit from Group 3	Amt. specified
Lemonade with saccharine	

This menu contains approximately 1000 calories.

Carbohydrate	89 gm	Ca	0 380 gm.
Protein	76 gm.	P	1.000 gm.
Fat	38 gm.	Fe	0.017 gm.

Vegetables and Fruits
(Measured after cooking)

Group 1:	
Spinach—fresh cooked or canned	½ cup
Chard—cooked	½ cup
Asparagus—cooked	6 stalks
Squash—cooked	½ cup
Lettuce—4 large leaves or ⅛ medium head	

The diet should be continued for three to four weeks. Even after improvement has occurred it may be continued provided nutrition and weight are protected adequately. When improvement is unquestioned, the liquid, puréed and minced diet may be replaced gradually with soft or regularly cooked foods. Other foods from the elimination diets then may be added, one or two at a time, every seven to fourteen days as follows: beef, bacon, rice, corn, spinach, asparagus, string beans, pears, peach, apricot and grapefruit. (Fruits may be tried early.) Uncooked vegetables and fruits should be added with caution. Foods commonly productive of allergy such as wheat, milk, eggs, fish, orange, apple, banana, berries, the cabbage group, honey and nuts, should be given only after marked or complete relief has persisted for several weeks or months. The necessity of partial or complete exclusion of allergenic foods gradually can be determined by such diet trial. To prevent recurrence of symptoms, the allergenic foods often must be totally excluded for months or years.

Further discussion of the treatment of this disease and its secondary results is on page *121*.

If the original diet has brought about no relief in three or four weeks and food allergy is definitely suspected, other elimination diets may be used for two or three months before food allergy is discarded as a possible cause of the colitis. It is possible that colonic allergy to foods in the prescribed elimination diet, or in fact to any food, may exist. Thus all vegetables may be excluded for a trial period of two or three weeks, providing weight and nutrition are protected, by ample calories and proteins in the foods eaten and by ample vitamins C, A and D and those of the B complex. Other supplemental diets are discussed on page 147.

Chronic allergy, especially to foods, produces changes in cellular
...ich requires long freedom from
...nptoms of ulcerative colitis are
...to eliminate for several weeks
those foods which are suspected of possible allergy, provided satisfactory weight and nutrition are maintained. Anxiety to test suspected or additional foods may retard or obscure progress which would be continuous with the initial or a slightly enlarged diet.

DIABETIC DIETS SELECTED FROM FOODS IN THE ELIMINATION DIETS

As discussed on page 178, various diabetic patients either suffer from definite and obvious food allergies or have symptoms which require a careful study of possible food allergy. The following are ...

... diets and the dietitian or office assistant of the physician may prepare the menus. Typical examples follow.

Comments. Other foods in Cereal-free El...
containing the required grams
for those ...

increase calories. Protein metabolism should be protected with an adequate intake of prescribed meat or soy bean. Strained homogenized lamb (see page 183) and later strained beef or liver may be combined with pureed vegetables, soy bean or split pea. Increased protein intake is necessary if serum proteins are not normal since healing of ulcerations is retarded when proteins are low. Blood plasma or blood transfusions also may be advisable to increase serum proteins. The oral and possibly the intravenous administration of amino acids may be advisable.

The following diet is recommended and may be modified as suggested.

Cereal-free and Fruit-free Elimination Diet
(Liquid, Soft, Puréed or Minced)
(Arranged Especially for Cases of Chronic Ulcerative Colitis)

Tapioca cooked with sugar, with or without soy bean milk, or with maple syrup or caramelized sugar.

Soy-potato starch pudding flavored with vanilla or caramel (no fruits or fruit flavors.)(8-f)

White or sweet potato—boiled, baked or riced, served with sesame or soy bean oil and salt.

Lamb-chops, roast or tongue, minced or ground at first, cooked with salt but without butter or other seasoning. Homogenized lamb (see page 183) may be combined with prescribed vegetables.

Soy bean purée—best made from canned cooked beans or from cooked soy bean flour. (Split pea purée may also be used.)

Carrots, beets, peas, squash, artichokes (fresh cooked or canned), strained or puréed. Salt, soy bean or sesame oil may be added but no butter or other ingredients.

Breads (recipes in Appendix) made of soy, lima, potato or tapioca flours. Soy bean butter, carrot preserves or maple syrup may be used in lieu of butter.

Soy bean milk (Mull-Soy or made by our soy bean milk formula) (see page 182).

Soy bean or sesame oil (used as noted above).

Sugar, beet or cane, may be taken in water or in maté (Brazilian tea) or in ordinary tea.

Salt.

Maté.

Tea.

Comments. This diet should be modified and prepared according to the directions for the use of the elimination diets on page 151. Nutrition and weight must be protected at all times. The effect of the war on elimination diets is discussed on page 152.

When intolerances for foods in this diet are indicated by history or by definite scratch skin reactions, other similar foods may be substituted. If definite digestive intolerance or apparent allergy to legumes exists, rice may be tried, especially if tapioca becomes unavailable during the war.

Until bowel activity decreases, feedings of moderate size should be given every three to four hours. Meat and soy bean are essential to meet the protein requirements. The carbohydrate foods, sugar and oil provide sufficient calories to maintain the proper weight. The oil may increase diarrhea in the initial diet.

Thiamin and other synthetic B vitamins, synthetic A or caritol in sesame oil, synthetic C, and viosterol in sesame oil or Drisdol should be given as required. Hypermotility may prevent vitamin absorption; therefore, hypodermic administration, especially of thiamin and other vitamins of the B complex, as well as of cevitamic acid, may become necessary in severe cases. Calcium carbonate, 4 grams daily, will protect the calcium requirements.

As with other elimination diets, their use as discussed on page 151 must be carefully read and followed Insulin therapy, of course, as indicated by the diabetes must be given. Similar diets satisfying other food allowances for diabetic patients and containing other foods for the special allergic problem of the patient can be prepared.

Diabetic Diet from Elimination Diet 1 and 2 (Rowe)

(Carbohydrate 70 gm, protein 25 gm, fat 30 gm., per meal—calories per day 2010)

Suggested Menu

	Amount	Wt. in gm	*Carb*	*Prot.*	*Fat*
Breakfast					
Grapefruit juice	¾ cup	135	13 0	0 6	..
Peaches cooked with juice or water-packed—no sugar added . . .	1 med.	150	13.0	0 8	..
Rice or corn flakes	1 cup	30	26 0	2.0	..
Corn and rice muffins with	1 muffin	.	18 0	1.7	7.6
Bacon fat or oil	1½ tsp.	7	..	..	7.0
Lamb patties, lean lamb cooked, E P.	2 oz.	60	..	16 0	5 0
Bacon, medium	3 strips	10	..	4.5	12 0
		Total	70.1	24.4	31.6
Lunch					
Lamb chops or roast, fat removed, cooked, E P	2 oz	60		18 0	5 0
Steamed rice . . .	½ cup	100	22.5	2 3	1.0
Steamed carrots . .	⅔ cup	100	6 6	1 0	..
Asparagus salad with dressing of	8 stalks	100	2 3	1.5	..
Sesame or soy oil and .	1¾ Tbsp.	24	..	..	24.0
Lemon juice or white vinegar					
Ry-Krisp . .	2	12	7.4	1.6	..
Apricots, fresh or water-packed .	3 whole	140	15 4	..	..
Pineapple juice, unsweetened	½ cup	120	15 9	.	..
		Total	70 1	24.4	30 0
Dinner					
Clear lamb or chicken broth					
Grapefruit—fresh . .	½—4" diam.	100	9 8	0 5	..
Chicken, visible fat removed, cooked E P.	2 oz	65		18 0	8 0
Sweet potato, baked	½ large	100	32.0	2 0	..
Spinach	½ cup	100	0 8	2 0	..
Artichoke salad with White vinegar and	1 large globe or 5 small hearts, canned	125	5 5	1 0	..
Sesame or soy oil . . .	1½ Tbsp.	22	.		22 0
Rye bread—100% . .	1 slice	25	13 0	2 0	..
Pineapple, fresh diced or	⅔ cup	100	10 0	..	..
Water-packed	1 slice	75	10 0	..	..
		Total	71.1	25.5	30.0

THE WHEAT-FREE DIET

The wheat-free diet is indicated when a definite allergy to wheat exists. Clinical allergy, as in all food allergy, may occur without a positive skin reaction. It is unusual to be allergic to wheat alone. Sensitizations to other foods, usually to some of the important ones, including milk, egg, rice, corn, fish, orange, apple, banana, etc., may exist along

As with other elimination diets, their use as discussed on page 151 must be carefully read ar [illegible]
must be given. [illegible]
and containing [illegible]
prepared.

Diabetic Diet from Cereal-free Elimination Diet 1, 2 and 3 (Rowe)

(Carbohydrate 70 gm , protein 25 gm., fat 30 gm. per meal—calories per day 2010)

Suggested Menu

	Amount	*Wt. in gm.*	*Carb.*	*Prot.*	*Fat.*
Breakfast (1)					
Pineapple juice, unsweetened	½ cup	120	16.0	..	..
Soy-lima potato muffin (Recipe 5)	1 muffin	..	17.4	6.0	6 6
Bacon fat or prescribed oil	1½ tsp.	7	..	..	7.0
Tapioca cooked with dried	2 Tbsp. dry wt.	20	17.0	..	..
Prunes and 1 cup water	3 med.	70	20.0	..	..
Lean meat patty	2 oz. cooked wt.	60	..	16.0	5.0
Bacon—medium	3 strips	15	..	4.5	12.0
		Total	70.4	26 5	30.6
Breakfast (2)					
Grapefruit juice	½ cup	120	11.5	0.5	..
Apricots fresh or water-packed	2 whole	100	10.0	1.0	..
Soy-lima potato muffin	1 muffin	..	17.4	6.0	6.6
Bacon fat or prescribed oil	1½ tsp.	7	..	..	7.0
Potatoes, cold boiled, browned	1 med.	150	32.0	3.8	..
in sesame or soy oil	1 Tbsp.	14	..	..	14 0
Lean beef or lamb	1¾ oz. cooked wt.	52	..	14.0	4.0
		Total	70.9	25.3	31.6
Lunch					
Lean beef, cooked E.P.	1½ oz.	42	..	11.5	2 3
Green lima beans	½ cup	75	17.6	5.6	0.6
White potato, boiled	1 med.	150	31.4	3.8	..
Tomato served with	1 small	125	4.1	1.1	..
Sesame or soy oil and	1¾ Tbsp.	24	..	..	24.0
White vinegar or lemon juice					
Soy bean-potato bread (4a)	1 slice	.	8 7	3.0	3.3
Pears, fresh or water-packed	1 small	100	8 3	..	..
		Total	70.1	25.0	30.2
Dinner					
Clear chicken, beef, or lamb broth (not canned)					
Tomato juice	½ cup	120	4 3	1.2	..
Lean lamb or chicken, E.P.	1½ oz.	45	.	12.0	2.6
String beans	½ cup	130	4 5	1.3	..
White potato, baked	1 med.	150	38.1	4 6	..
Asparagus salad	6 stalks	85	1.4	2.1	..
Sesame or soy oil	1¾ Tbsp.	24	..	.	24.0
White vinegar or lemon juice					
Soy bean-potato bread	1 slice	.	8.7	3.0	3.3
Peaches, fresh or water-packed	1 med.	150	13.2	0 8	..
		Total	70.3	25 0	29.9

(Comments on diet on page 195)

Other foods in Elimination Diet 1 and 2 in amounts containing the required grams of carbohydrate, protein and fat may be substituted for those in the above menu. The preparation of this elimination type of diabetic diet and the use of calcium and additional vitamins should follow the suggestions on pages 140 and 151.

mallows Bread, buns, and pretzels may be rubbed or sprayed with egg to produce a sheen or crust. Rumford's baking powder, Ovaltine, Ovomalt, and Cocomalt contain egg. Soups, coffee, and certain wines may be cleared with egg white. Some pharmaceutical products and emulsions may contain egg. Thus, special recipes must be used in the home and by bakers for patients on egg-free diets.

Eggs of various birds contain similar allergens and many patients who are sensitive to hen's egg also are allergic to duck, goose, or turkey eggs. Some mildly allergic patients tolerate the denaturized hard boiled egg.

Some patients are so sensitive to egg that they cannot handle an egg or have eggs on the table or eat food kept in a refrigerator together with eggs. The smell of eggs being cooked may cause symptoms. These allergic patients should not be kissed by a person who has just eaten egg because of the residual amounts on the lips. Some egg-sensitive patients, moreover, are also sensitive to chicken meat. Especially meat of hens may be offensive since a moderate amount of egg allergen may get onto the hen during the cleaning. For this reason hens and not friers or roosters are excluded from the elimination diets.

THE MILK-FREE DIET

Certain patients may be allergic only to milk. The elimination of every trace of milk is required in the very allergic patient, during the investigative study of possible food allergy. *Because maximum milk allergy must be* [illegible] *when the patient is symptom-free, the degree of sensitization to milk can be determined by trial feeding.* Then total exclusion of all milk products may be necessary or small amounts of butter, or of milk, perhaps in cooking only may be tolerated. In infancy, a milk substitute such as the soy bean preparations should be used, as discussed on pages 182 and 183.

Sobee, which was originated by Hill and is prepared by Mead Johnson & Co , is a dry powder of the following formula:

	Per cent		Per cent
Soy bean flour	61	Dextri-Maltose	6
Olive oil	19	Dicalcium phosphate	4
Arrowroot starch	9	Sodium chloride	1

Six to 7 tablespoonfuls and 7 ounces of water are brought to a boil and cooled; sugar is added according to the physician's order. This formula makes a palatable, easily digested milk substitute. Its approximate content follows:

	Per cent		Per cent
Fat	2 8	Salts	1.0
Protein	4.2	Carbohydrates	4 1

As stated on page 179, Sobee also may be cooked with water as a mush. Fluid preparations similar to Sobee are available. Mull-Soy diluted

with wheat allergy. Therefore, especially where food allergy is suspected, it is better to use the elimination diets rather than a wheat-free diet during a period of diagnostic study of possible food allergy.

However, when wheat alone is to be excluded from the diet, the following facts must be remembered. Every trace of wheat must be excluded when marked allergy exists. The toasting or super-heating of wheat bread or other wheat products does not denaturize the allergen sufficiently to prevent reactions in the very allergic individual. Bakery products must be made at home or by supervised or trusted bakers with flours which are wheat-free. Ordinary rye and most pumpernickel bread contains varying amounts of wheat flour. Commercial rice, corn, soy, lima, and potato breads contain wheat or gluten wheat flours. Most so-called self-rising flours, pancake and cake flours, health grains and brans contain wheat. Grapenuts, Pep, and many other breakfast foods, as listed on page 223, contain wheat. Today, the content of all food products of the above types are listed on the labels. However, changes in content may be made without adjustment of the labels. Macaroni, vermicelli, noodles, so-called pastes, and most tamales, enchilades, and other so-called Spanish or Mexican foods, especially those sold commercially, contain wheat and perhaps milk or egg. Vitavose and other vitamin products may contain wheat germ. Many soups have pastes cooked in them or are thickened with wheat flour. These are only a few possibilities of the use of wheat in various foods and recipes.

The wheat-free diet, therefore, demands dependable wheat-free breads, cookies, cakes, and other bakery products. Recipes are available on pages 232 to 250. Ry-Krisp is a desirable wheat-free cracker. Some kinds of rye crisp are dusted with wheat flour. Various Mexican foods which are made with cornmeal only are desirable; but frequently wheat flour is included. Corn crisps, potato chips, rice-corn muffins, corn pone, and various corn, rice, barley, oats, and rye cereal products are useful. Various flours, including potato, cassava, banana, chestnut, almond, pea, bean, peanut, lima, soy, poya, sweet potato, and pumpkin are available for wheat-free diets.

THE EGG-FREE DIET

The egg-free diet demands a most careful selection of foods. As a trial diet, it is usually inadvisable since few patients are sensitive only to egg. However, after a period of trial dieting egg may finally prove to be the one important food to which allergy exists. When egg allergy is present, it is almost always necessary to exclude the albumen and the yolk, since it is difficult to free the yolk entirely from all albumen.

Egg is used in practically all ice cream, sherbets, and water ices, cakes, cookies, many French toasts, puddings, desserts, mayonnaise, sauces, and salad dressings. Macaroni, spaghetti, noodles, batters, prepared meats, some sausages, beef juices, and meat jellies contain egg. It is used in many candies and bar confections, and in certain marsh-

definitely controlled. After the symptoms are relieved and the tolerance for milk has been determined, canned milk may not cause a recurrence of symptoms but they may result from regular milk.

The kind of milk in various cheeses has been discussed on page 67. Other ingredients of cheese include fungi of varying types.

The use of almond milk has been advised by Fischer, Chapin, Schiff and Lane. It contains approximately 3.3 per cent protein, 1.1 per cent carbohydrate, 8 1 per cent fat and 93 calories per 100 grams. The method of its preparation follows: Sweet almonds (250 grams) are soaked in boiling water, the skins are removed and the kernels dried. They are ground in a mortar or in a fine food chopper with one ounce of water and mixed with a quart of iced boiled water. After standing two hours the ground substance is filtered through a fine cloth. Refrigeration prevents fermentation.

sl

C

of dicalcium phosphate daily. It may be included in the milk or mixed with other food. The cost of this milk is excessive compared with that of soy milk, and the protein and amino acid content may not meet human

eds supple-
The ways

The writer believes that if milk is to be excluded, it is best to use the elimination diets while the possibility of food allergy is studied. Milk and its products enter into so many bakery products and other foods that it is usually very difficult for the patient to have foods prepared and cooked so that every trace of milk is excluded. The elimination diets, on the other hand, are milk-free, and in addition, many other foods are excluded which with varying frequencies produce food allergy in patients. After symptoms are relieved, the various foods can be added, and the degree of allergy for milk and other foods can be gradually determined.

ADDITION OF FOODS TO THE DIET

As important foods are added to the elimination diet, the physician must discuss with the patient the various ways in which this may be done. The addition of milk and egg usually is easy. The addition of wheat needs special discussion.

before milk and eggs are a

To conserve the physician

directions the following

Addition of Whe

tained in Shredded

other cereal products

as indicated in the listed ingredients on the labels.

Wheat flour, in the form of refined, whole, graham, or gluten flour may be used.

with an equal amount of water and Kreme O'Soy used undiluted, contain about the same constituents as cow's milk.

A soy bean emulsion which is quite acceptable can be made inexpensively according to the detailed directions found on page 183. The *protein, calcium and calorie* content as indicated is comparable to that of cow's milk.

For those infants who cannot take soy bean, Cemac, as prepared by Mead Johnson & Co., is available. It was proposed by Cohen in 1933 and is similar to that which the writer published in 1931 (see page 184). Recently, homogenized liquid lamb, beef and liver have been prepared by Clapp & Co., with which individualized formulæ similar to Cemac may be made at home according to the child's nutritional demands and possible allergies and the physician's orders (see page 184).

In children and adults, on a milk-free diet, all mixed foods must be scrutinized carefully to prevent the ingestion of any trace of milk or its products. This care is essential while the possibility of milk allergy is being studied. If it is found after relief of symptoms that the allergy to milk is moderate, butter and small amounts of milk may be permitted in the diet. Often, however, total exclusion of milk and all its products is required to produce maximum and continual relief.

It must be remembered that practically all commercial breads, cakes, cookies and other bakery products, contain milk, often in powdered form, or butter. Furthermore, milk is used in many canned soups, in Ovaltine, Cocomalt, milk chocolate, malted milk, many candies, ice cream, and almost all sherbets and commercial ices. Many patients fail to realize that cream contains from 60 to 85 per cent milk, and that butter contains 0.5 to 1.5 per cent milk solids. Moreover, oleomargarines of all types, including Nucoa, contain from 1.5 to 2 per cent milk solids. Many pies, breads, and other bakery products are sprayed with milk. Milk or butter is used in mashed potato, souffles, many gravies, sauces, puddings, custards, and desserts.

Some patients are allergic to the milk of one animal and not to that of another. The lactalbumins of milks of different animals are dissimilar. Thus, goat's milk can be tolerated by some infants and children who are sensitive to the lactalbumen of cow's milk. The caseins of the milks of different animals seem identical and allergy thereto explains sensitization to milks of several animals. In Europe, the milks of the ass, mare, and ewe are used.

Human milk may be used for infants. It usually is available fresh or canned.

Hill and others have reported that the oral use of amino acids resulting from hydrolysis of casein, maintains protein nutrition in milk-sensitive ... this prepara-

... on page 58.

As stated, some mildly milk-sensitive patients can tolerate heated and canned milk. However, if milk allergy is suspected, every trace of milk in all forms should be eliminated from the diet until symptoms are

CHAPTER VI

APPENDIX

VITAMINS

Their Characteristics, Distribution and Requirements

Vitamin A is fat soluble and is not destroyed by freezing or boiling or by the high temperatures of canning, provided oxidation is prevented. It may rapidly diminish after defrosting. Drying of foods may decrease this vitamin because of oxidation. Mineral oil by mouth, taken for constipation, absorbs vitamin A and its precursor from the food. If taken only one to two times a day, well after meals, such absorption is not serious.

Vitamin A, in its precursor, the yellow pigment, carotene, usually occurs with chlorophyll in green leaves The white or light parts of the plant have little of this vitamin. The yellow and green leaf vegetables and carrots, sweet potatoes, and lettuce, chard, and parsley are rich in vitamin A. Apricots, yellow peaches and prunes contain more than other fruits The large amount of vitamin A in fish oils comes from the minute marine plants which are eaten by small fish which, in turn, are eaten by larger fish such as the cod and halibut. One U.S P. or International unit is contained in .6 microgram of crystalline beta-carotene. Deficiency of vitamin A, according to McLester, disturbs the structural integrity of epithelial cells.

In patients allergic to vegetables and fruits, the daily requirement of vitamin A as listed below, must be assured. This can be computed from the average vitamin content of foods in recent published tables.*

Vitamin B_1, known as thiamin, has been synthesized in crystalline form. It occurs in varying amounts in many plant and animal foods, especially in the germ and outer covering of cereal grains and seeds, in milk, eggs, liver, yeast, and fruits and vegetables. It is not broken down easily by cooking except in an alkaline medium. It is water soluble so that vegetables should be cooked in as little water as is possible.

It seems that 1 or 2 mg of thiamin are sufficient for health but that 5 or more mg daily are necessary when a deficiency state has arisen from a long standing lack of this vitamin. Not more than 5 mg. by mouth can be absorbed in one day One mg of thiamin equals approximately 333 International units of B.

* See U. S Department of Agriculture Circular No. 638 by L. E Booher, E. R. Hartzler, and E. M. Hewston, entitled "A Compilation of Vitamin Values of Foods in Relation to Processing and Other Variants." May, 1942. Price 25 cents.

especially in the form of gluten flour (see page 60) to the various wheat- milk- and egg-free bakery products listed in this volume enhances greatly their lightness and palatability.

When wheat is added to the diet, bread and other bakery products containing wheat are not necessarily allowed. Most of these contain various ingredients which may not be in the diet. Milk, egg, various oils or shortenings and other cereal grains may be included. White wheat bread almost always contains milk, and sometimes egg or some other flour. Various shortenings containing cottonseed and other forbidden oils or fats should be avoided

Addition of Rice.—Boiled rice may be served hot with cane sugar or maple syrup as cereal, or it may be served in place of potatoes.

Cold boiled rice fried in sesame oil, or other specified oil, may be served with maple syrup or sugar, or any of the fruit juices allowed on the diet.

Puffed rice may be served with fruit juices and sugar or made into candy according to the recipe on page 239.

Rice cooked with a small amount of pears, peaches, or apricots and sugar may be served as a pudding

Rice flakes and Rice Krispies may be served with any of the fruit juices allowed on the diet and sugar.

Brown rice or wild rice may be cooked alone or in any of the ways noted above. Cream of Rice, a packaged cereal, cannot be used since it contains powdered milk

If corn or rye has been added to the diet, bread, muffins, and cookies may be made by combining corn or rye flour with rice flour according to the recipes on page 237. Rice bread may also be made (page 237).

Addition of Corn.—Canned corn (cream style), whole kernel, or on the cob, fresh or canned, but no butter or other seasonings which are not on the diet may be used. Mazola or other prescribed oil with salt may be used on the corn in place of butter.

Cornmeal may be cooked with water and a pinch of salt to make a mush. This may be served hot with fruit juices and sugar or maple syrup. The cold cornmeal mush may be fried in sesame oil and served with maple syrup. Polenta, a coarse cornmeal, may be cooked in the same manner.

Corn flakes may be served with any of the fruit juices allowed on the diet and sugar

Hominy may be boiled or fried in sesame oil and served with maple syrup. Canned hominy is available

Cornstarch may be used in cooking and fruit cornstarch pudding may be made by substituting cornstarch for rice

Corn syrup such as Karo may be used in the candy recipes, in cooking, and as a substitute for maple syrup.

Mazola oil may be used in cooking if desired.

Corn pone may be made according to the recipe on page 237.

If rice or rye have been added to the diet, bread, muffins, and cookies may be made by combining rice or rye flour with cornmeal, according to the recipes on pages 237 and 238.

... and controls the concentration of the calcium ... r bone calcification occurs. ... and associated symptoms. Irradiation of cereals, meat, milk, eggs, fats, oils, various vegetables, and many other foods, and especially the sterol of ergot called ergosterol produces mainly a crystalline substance called calciferol which is probably pure vitamin D.

Several forms of vitamin D are known. Activated ergosterol obtained chiefly from irradiation of yeast is in viosterol and in the milk of cows which have been fed irradiated yeast. Activated 7-dehydrocholesterol results from the action of sunlight and other ultra-violet rays upon animal fats It is present in irradiated milk and is the main form of vitamin D in antirachitic fish oils. Both these forms of vitamin D seem of equal therapeutic potency in man. Sunlight or ultra-violet rays on the skin also convert the provitamin in the oily secretions into vitamin D which is absorbed by the blood. One U.S.P. or International unit is the activity of .025 microgram of crystalline vitamin D. Only .25 gram is in a barrel of ordinary cod-liver oil.

Vitamin D does not occur in many foods. Fish, especially those containing body oil such as salmon, sardines, and herring, contain moderate amounts. The oils of the livers of blue fin tuna especially, of sword fish, yellow fin tuna, and black sea bass contain large amounts. The oils of the livers of many rock fish, cod, halibut, salmon, and to a lesser extent of many other fish, contain decreasing amounts of vitamin D. Cow's milk, especially during the summer, contains moderate amounts of this vitamin. Eggs also contain a fair quantity.

Cod-liver and other fish oils, therefore, vary in their content of vitamin D. This is especially true when they are fortified with viosterol. The content of each preparation must be determined by the label. The requirements for vitamin D are noted below. The requirement of the adult is in question. Considerable amounts are manufactured by the action of sunlight on the skin Excessive dosage of vitamin D is definitely dangerous.

Vitamin E was discovered and isolated in its pure form by Evans and his co-workers Its lack results in failure of placental and fœtal development and degeneration in the male and female germ cells. Muscular dystrophies in man, sterility and habitual abortion may be due at times to a deficiency of vitamin E. It is widely distributed in foods, especially in butter, grains, and vegetables. It is stable at high temperatures and in light.

Vitamin K maintains the prothrombin level in the blood and thus the clotting time. Its absorption is aided by bile in the intestine. The bleeding of obstructive jaundice is benefited by administration of this vitamin. It is especially abundant in alfalfa and is found along with vitamin C in other foods.

Vitamin G or riboflavin (B_2) is water soluble and is a greenish yellow substance of the flavin group. It influences the oxidation in the cell and the general health of the body. Its lack seems to cause lesions on lips and angles of the mouth known as cheilitis. Man apparently requires 2 to 3 mg. of riboflavin a day. One Sherman-Bourquin unit of vitamin G is equal to about 3 micrograms of riboflavin. One milligram thus contains from 200 to 300 units. Foods containing the most riboflavin are: milk; eggs, liver, and the green leaf vegetables. Liver contains about fifteen times as much as muscle.

Nicotinic Acid is one of the vitamins of the so-called B complex. Its curative action in pellagra has been demonstrated by investigations, especially of Elvehjem, Spies, and their collaborators. It is found in yeast, liver, lean meats, and milk. Nicotinic acid amide does not produce flushing, tingling and a fall of blood-pressure arising from the acid. For moderate deficiencies, 50 to 100 mg. are given three times a day, either by mouth or parenterally in solution. Large doses up to 500 mg. a day may be desirable.

Vitamin B_6 (pyridoxine) is called the antidermatitic factor of the B complex. It is synthesized as a pyridine base. Its lack in rats leads to cessation of growth, an erythrodermic dermatosis, and general debility. A microcytic hypochromic anemia develops in dogs when the diet is deficient in this vitamin. Certain patients with pellagra and beriberi with central nervous system manifestations require 50 mg. of this vitamin daily, as well as nicotinic acid, thiamin, and riboflavin, according to Spies.

Pantothenic acid (B_4) is another member of the B complex. It may not be essential in man. It exerts an anti-grey hair action in rats, dogs, foxes and chickens.

Inœitol, para-aminobenzoic acid, choline and biotin probably are vitamins under certain conditions.

Vitamin C (ascorbic or cevitamic acid) controls the formation of the intercellular reticulum and bands of collagen in tissue cells Its lack in the diet results in scurvy associated with increased capillary fragility, anemia, weakness, and reduced resistance to infection. It is prescribed in its synthetic form. The international unit is .05 mg. of l-ascorbic acid.

Vitamin C is decreased in varying degrees by drying, canning, cooking, freezing, or storing of foods. Contact with metal, exposure to heat, light, air, and especially to oxidation, is detrimental. Canned products, protected against oxidation, show a slight decrease in vitamin C.

Increased amounts are required during infections and when a deficiency has existed. The daily requirements of vitamin C are listed below.

The approximate amounts of cevitamic acid (vitamin C) in 100 gram amounts of various fruits and vegetables are listed in recent tables (see page 201). The content varies as much as 50 per cent with the type of soil and weather conditions.

5. When moderate dust susceptibility is suspected, the pillows of the beds in the room should be covered with three pillow slips, one being put on one way, another the opposite way, and the third one in the original direction. The mattress should be wrapped in old sheets. The bedding should consist of well washed old woolen or cotton blankets according to the doctor's order. No quilts, feather beds, or feather or down comforters should be on the bed or in the room or closets.

6. No overstuffed furniture should be left in the room. Day beds or couches, especially, should be removed and all plants and flowers should be excluded. Flowers, vines, and shrubbery close to the house or in gardens within 10 or 15 feet from the windows of the bedroom should be suspected as possible sources of allergens. Possible allergy to dusts from flowers, shrubs, animals, birds, or dusts from roofs or in adjoining yards must be considered.

7. For patients who are extremely sensitive to house dust and particularly to mattress or feather dust, dust-proof covers for mattress and pillows may be necessary. These may be made commercially (see page 31) according to the measurements of the mattress and pillows, or they may be made by the patient from thin rubberized cloth. Such cloth with a rubberized surface on one side costs approximately *50 cents* a yard. Such covers should be made with long flaps on the ends so that they can be turned over several times and pinned. The same long flaps should be made on the pillow slips. Zippers on the ends prevent the escape of dust more effectively.

8. Dust control of the sitting and living rooms of the patient is important. The overstuffed furniture and rugs should be vacuumed very carefully. Curtains and drapes should be thoroughly cleaned and walls, woodwork, and floors should be wiped frequently to eliminate all possible dust. All animals, flowers, and plants should be removed from the house unless specially allowed by the physician.

9. If marked sensitization to house dust or the dust from upholstered furniture or drapes is present, a small room devoid of all overstuffed furniture or carpets should be used by the patient while he is reading or working at home.

QUESTIONNAIRE FOR THE ALLERGIC PATIENT*

NAME:
ADDRESS:
AGE:
REFERRED BY:

I. ASTHMA:

1. Age and date when asthma began.
2. Describe a typical attack.
3. How often do attacks occur? Usual duration?
4. During what season are symptoms worse?

* Adapted from that by Vaughan, W. T.: Practice of Allergy, St Louis, C. V. Mosby & Co., 1934.

DAILY NUTRITIONAL REQUIREMENTS

Recommended Number of Calories and Recommended Daily Allowances for Specific Nutrients.[1]

Committee on Foods and Nutrition, National Research Council—May, 1941

	Calories	Protein, gm.	Calcium, gm.	Iron, mg.	A,[3] I.U.	Thiamin (B₁),[2] mg.	Ascorbic acid (C),[2] mg.	Riboflavin, mg.	Nicotinic acid, mg	D I.U.
Man (70 kg.)										
Moderately active	3000	70	0.8	12	5000	1.8	75	2.7	18	
Very active	4500	..	.	.	.	2.3	..	3.3	23	[5]
Sedentary	2500	..	.	..	..	1.5	..	2.2	15	
Woman (56 kg.)										
Moderately active	2500	60	0.8	12	5000	1.5	70	2.2	15	
Very active	3000	..	..	..	..	1.8	..	2.7	18	[5]
Sedentary	2100	..	..	.	..	1.2		1.8	12	
Pregnancy, latter half	2500	85	1.5	15	6000	1.8	100	2.5	18	400–800
Lactation	3000	100	2.0	.	8000	2.3	150	3.0	23	400–800
Children up to 12 years										
Under 1 year[4]	100 per kg.	3–4 per kg.	1.0	6	1500	0.4	30	0.6	4	400–800
1– 3 years	1200	40	1.0	7	2000	0.6	35	0.9	6	
4– 6 years[6]	1600	50	1.0	8	2500	0.8	50	1.2	8	[5]
7– 9 years	2000	60	1.0	10	3500	1.0	60	1.5	10	
10–12 years	2500	70	1.2	12	4500	1.2	75	1.8	12	
Children over 12 years										
Girls—13–15 years	2800	80	1.3	15	5000	1.4	80	2.0	14	[5]
16–20 years	2400	75	1.0	15	5000	1.2	80	1.8	12	
Boys—13–15 years	3200	85	1.4	15	5000	1.6	90	2.4	16	[5]
16–20 years	3800	100	1.4	15	6000	2.0	100	3.0	20	

[1] These allowances can be met by a good diet of natural foods; this will also provide other minerals and vitamins, the requirements for which are less well known

[2] 1 mg thiamin equals 333 International Units, 1 mg ascorbic acid equals 20 International Units; 1 International Unit equals 1 U S P unit

[3] Requirements may be less than these amounts if provided as vitamin A, greater if chiefly as the provitamin carotene.

[4] Needs of infants increase from month to month The amounts given are for approximately six to eighteen months. The amounts of protein and calcium needed are less if from breast milk

[5] Vitamin D is undoubtedly necessary for older children and adults When not available from sunshine, it should be provided probably up to the minimal amounts recommended for infants

[6] Allowances are based on the middle age for each group (as 2–5, 8 etc), and for moderate activity.

INSTRUCTIONS FOR THE ESTABLISHMENT OF ENVIRONMENTAL CONTROL*

In order to decrease the possibility of inhaling various dusts, pollens, and other allergens from the air of the home, it is necessary to prepare the bedroom and sitting room in the following manner.

1. The curtains should be taken down, and either well shaken or freshly laundered before rehanging. All surfaces of roller shades or blinds should be wiped free from dust.

2. Carpets and underpads should be removed Floors should be thoroughly cleaned and washable small rugs should be used.

3. The ceiling, walls, picture moulding, window frames, and all woodwork should be wiped free of all dust preferably with slightly damp cloths.

4. All surfaces of furniture, the springs of the mattress, the frame of the bed, the backs and surfaces of all pictures should be wiped with damp cloths.

* For further discussion of environmental control, see page 31.

QUESTIONNAIRE FOR THE ALLERGIC PATIENT

(Continued)

II. Environment:

10. Do they come into the house?
11. Any livestock nearby?
12. How far is the barn from the house?
13. What feeds, hay, grains, etc., are kept in the barn?
14. How old is your house or apartment? Is it damp or sunny? Is the cellar damp? Length of residence in this house?
15. Do you have trouble only at home?
16. How is the house heated?
17. [illegible]

[illegible]

20. Do you always sleep in the same bedroom? Do you sleep alone? In a room alone?
21. Of what is your pillow made? Your mattress?
22. What kind of covers do you have? Any down comforts?
23. What kind of floor coverings?
24. Have you many pictures and furniture in the room?
25. How is the room ventilated?

III. Hay Fever:

1. What nasal symptoms do you have?
2. Age and date of onset.
3. Do you have itching of the roof of the mouth? The eyes? The throat? Inside of nose? Deep in the ears? Between shoulder blades? On the skin?
4. Do your eyes water, itch or become congested?
5. Can you detect odors easily? Can you taste well? Is your nose frequently stopped up?
6. How often do symptoms occur? How long do they last?
7. Are they becoming more frequent and *persistent*?
8. Are symptoms limited to any yearly season? If so, when?
9. When are they the worst?
10. Is there any change from one season to another? If so, how?
11. Are you worse day or night?
12. Relationship to daily activities?
13. Do you have attacks of uncontrollable sneezing? When?
14. Do you know any cause for your symptoms? See causes related *to* asthma, (Section I).
15. Are you subject to head colds or sinus trouble? How many each year?
16. Do they differ from hay fever as described?
17. Character of discharge from nose during colds? Amount, color, consistency.
18. How long do they last? Does bronchitis occur?
19. What season do they occur?
20. Do you have wheezing, cough or tightness in the chest during colds or hay fever?

IV. Skin

1. Have you ever had eczema or any chronic skin eruption? Describe *it*. Where did it begin and how did it spread?
2. Is it constant or periodic? Of sudden or gradual onset?
3. Is there seasonal variation?

QUESTIONNAIRE FOR THE ALLERGIC PATIENT

(*Continued*)

I. Asthma:

5. If seasonal, give date of occurrence. Are they becoming more frequent, lasting longer and less severe?
6. Are you entirely well between attacks?
7. Is there much coughing?
8. Do you raise sputum? What color: whitish, yellowish, or greenish? How much?
9. When did the last or present attack begin?
10. What time of day do symptoms occur? Only at night?
11. Are you better on hot or cold days? Is there any relationship to fog, rain, or wind?
12. In what part of the country or city have you been free from trouble? For how long? Does change of residence in the same city give relief? Are you better at the seashore or in the mountains?
13. Have you ever had croup? When? Describe in detail.
14. Do you have bronchitis? Describe attacks, time of occurrence, frequency, etc. Does wheezing occur?
15. Do any of the following cause asthma?
    - House dust?
    - Road or street dust?
    - Any kind of smoke?
    - Flowers of any kind?
    - Face powders or other cosmetics?
    - Any vapors or peculiar odors?
    - Contact with animals such as cats, dogs, sheep, cattle, horses, goats, canaries, chickens, ducks or geese?
    - Contact with crowds?
    - Going to theaters?
    - Going into any particular buildings?
    - Going into cellars or musty or damp places?
16. Do your symptoms follow or accompany head colds? Duration of colds? How soon after the cold?
17. Are your symptoms related to:
    - Menstrual periods?
    - Fatigue?
    - Emotional upsets?
18. What treatment have you had? Give details.
19. What drugs or remedies do you use for relief? Describe their effects. Are you sensitive to any drugs or medicines? What are they? What symptoms do they produce? How soon after taking?
20. Have you used adrenalin (epinephrine) by inhalation or by injection?
21. Have you ever had skin tests or diets?

II. Environment:

1. How long have you lived in your present neighborhood?
2. What trees are in this locality?
3. Are there open fields?
4. What weeds are in this locality?
5. Any special kind of insects?
6. What factories within a mile?
7. What flowers near the house?
8. What grasses in the lawn?
9. What pets in or around the house?

QUESTIONNAIRE FOR THE ALLERGIC PATIENT

(Continued)

VI. Gastro-intestinal:

5. Do you pass mucus in the stools? How often? Have you been told you had colitis? Any blood?
6. Do bowel movements [illegible] you [illegible]

VII Genito-urinary:

1. Do you have attacks of frequent urination? Bladder pains? So-called kidney colic? Any bladder trouble? Burning on urination? Describe in detail.

VIII Neuromuscular:

1. Do you have low blood-pressure? What is your usual blood-pressure?
2. Have you ever had convulsions or epileptic seizures? Spells of unconsciousness? Describe.
3. Do you tire easily? Have you muscle soreness or aching of body? Attacks of extreme fatigue or sleepiness in the daytime? Do you have nightmares? Are you troubled with sleeplessness? Give details.

IX. Diet:

1. Do any particular foods cause your trouble?
2. What symptoms do they produce?
3. Any particular food dislikes? Reason for dislike? What symptoms do they produce?
4. For what foods have you a special craving?
5. Do particular combinations of foods cause trouble? Does overeating increase symptoms?
6. Have you been on any special dietary restrictions for your trouble? What were these diets? Did they benefit you? If so, how? Any other benefits or harmful effects?
7. What is your average diet—average daily helpings of fruits, vegetables, meats Average daily amount of wheat, milk and egg products. Accessory foods such as cod-liver oil?
8. What vitamins have been taken?

X. Occupation:

Describe your occupation, giving daily routine and places you visit. Any regular contacts in your daily routine that you might suspect? Is your place of business well ventilated? How heated? Dusty? Flowers or plants in your place of business?

XI. Miscellaneous:

1. Have you had any *x*-ray photographs of your chest? By whom? What did it show?
2. Have you had *x*-ray photographs of your sinuses? By whom? What did they show?
3. What other *x*-ray photographs have you had made? What did they show?
4. Have you had any operations [illegible] Give date of operation, [illegible]
5. What further remarks [illegible] of interest or help?

QUESTIONNAIRE FOR THE ALLERGIC PATIENT

(*Continued*)

IV. Skin:

4. Any chronological association with home or other contacts?
5. What makes it worse? Foods, clothing, menses, illness and remedies, miscellaneous things?
6. What have you done for it—internal and external medicaments and treatments?
7. What medications do you use (proprietary or prescribed) for headaches, constipation, "acid in the system," "blood purifiers," "tonics," for sleeplessness, nervousness, coughs, menstrual periods? Bromo-Seltzer? Bromo Quinine? Iodized salt? Aspirin? Alkaseltzer? Other medication, internal or external, proprietary or prescribed?
8. What cosmetics do you use—scalp tonics, wave-sets, powder, lipstick, rouge, beauty creams, freckle creams, wrinkle removers, perfumes, soaps, bath salts, astringent lotions, depilatories, nail polishes, deodorants, massages, etc.?
9. Any used by others at home?
10. Applied at beauty parlor or elsewhere?
11. What occupational or avocational contacts do you have—at work (principal substances handled, incidental substances such as cleaners, are they liquid or solids)—at home (cleaners, insecticides, professional exterminators, pets, plants, substances used in their care, furniture, drapes, clothing—new, cleaned, dyed—hobbies, photography, stamps, golf, cards, other games), miscellaneous?
12. Have you had urticaria (hives, nettle rash)? When? Recognized cause?
13. Are you bothered by itching of the skin? When? Cause? Relieved by? Parts of skin involved?
14. Have you any other skin eruption? Describe it
15. Are you susceptible to poison ivy or poison oak?

V. Headaches:

1. Are you subject to frequent headaches? Character and duration? Age and date of onset? Frequency of recurrence?
2. What portion of the head is involved?
3. What time of day do they occur? Ever begin at night?
4. To what have you attributed them?
5. What gives you relief?
6. Have you had sick headaches (migraine)? Give frequency of occurrence. Cause if possible. Confined to one side? Which?
7. Do you begin with eye symptoms, streaks of light, flashes, etc ?
8. Associated stomach symptoms?
9. What gives you relief? Any foods responsible?

VI. Gastro-intestinal:

1. Do you have any indigestion? Nausea? Vomiting? Sour stomach? Full feeling? Belching? Gas in lower bowels? Cramping, soreness or pain in abdomen? Give locations.
2. Do symptoms occur in attacks? Are they persistent or chronic? Frequency?
3. Are you entirely well between attacks?
4. Are you constipated? Frequency of bowel movements? Character of bowel movements, hard, soft but formed, mushy or watery. Do you use cathartics or enemas? Hemorrhoids? Itching of anus?

When two or more antigens are sent simultaneously, each one must be measured [illegible] [illegible] [illegible] tize both arms to each antigen.

If there is any other information which you require in this treatment we shall be glad to have you communicate with us.

Schedule I for Antigen Therapy

(Antigen to be administered subcutaneously every ________ days with tuberculin syringe and a 26 gauge ⅜ inch hypodermic needle.)

1st	injection	0 03 cc. (3/100 cc.)	of dilution	1-5000
2d	"	0 05 cc. (5/100 cc.)	"	"
3d	"	0 10 cc.	"	"
4th	"	0 20 cc.	"	"
5th	"	0 30 cc.	"	"
6th	"	0 45 cc.	"	"
7th	"	0 05 cc.	"	1-500
8th	"	0 10 cc.	"	"
9th	"	0 20 cc.	"	"
10th	"	0 30 cc.	"	"
11th	"	0 45 cc.	"	"
12th	"	0 05 cc	"	1-50
13th	"	0 10 cc.	"	"
14th	"	0 15 cc.	"	"
15th	"	0 20 cc.	"	"
16th	"	0 25 cc.	"	"
17th	"	0 30 cc.	"	"
18th	"	0 35 cc.	"	"
19th	"	0 40 cc.	"	"
20th	"	0 45 cc.	"	"
21st	"	0 50 cc.	"	"
22d	"	0 55 cc.	"	"
23d	"	0 60 cc.	"	"
24th	"	0 65 cc.	"	"
25th	"	0 70 cc.	"	"
26th	"	0 75 cc.	"	"
27th	"	0 80 cc.	"	"

Schedule II for Antigen Therapy

(Antigen to be administered subcutaneously every ________ days with a tuberculin syringe and a 26 gauge ⅜ inch hypodermic needle.)

1st	injection	0 05 cc. (5/100 cc)	of dilution	1-5000
2d	"	0 10 cc.	"	"
3d	"	0 15 cc.	"	"
4th	"	0 20 cc.	"	"
5th	"	0 25 cc.	"	"
6th	"	0 30 cc.	"	"
7th	"	0 35 cc.	"	"
8th	"	0 40 cc.	"	"
9th	"	0 45 cc.	"	"
10th	"	0 05 cc.	"	1-500
11th	"	0 10 cc	"	"
12th	"	0 15 cc.	"	"
13th	"	0 20 cc.	"	"
14th	"	0 25 cc.	"	"

QUESTIONNAIRE FOR THE ALLERGIC PATIENT

(*Continued*)

XII. Residences:

Give residences and approximate time in each since birth.

XIII. Past History:

1. What diseases have you had?
2. How is your general health?

XIV. Family History:

List the occurrence of asthma, hay fever, nasal trouble, hives, eczema, headaches, chronic indigestion, and migraine in your parents, grandparents, aunts, uncles, brothers, sisters and children.

GENERAL DIRECTIONS FOR THE ADMINISTRATION OF POLLEN ANTIGENS

For____

________________________19___

My dear Dr.____

* These solutions must be administered at intervals as indicated in the accompanying schedule THE DOSE MUST BE ACCURATELY MEASURED WITH A TUBERCULIN SYRINGE AND CAREFULLY INJECTED SUBCUTANEOUSLY UNDER STERILE PRECAUTIONS. The injection should be made just under the deep layers of the skin itself in the outer side of the upper arm posterior to its midline, this area being free from superficial large veins. It may also be given in the outer sides of the thighs. THE SOLUTIONS MUST BE KEPT IN A REFRIGERATOR OR THEY WILL DETERIORATE.

The normal local reaction after a pollen injection consists of a tender reddened area l [illegible] after the injection

With [illegible]

reactio [illegible]

asthma occurring within one to two hours after treatment The patient should wait in your office for twenty to thirty minutes after each injection and if any sign of a general reaction occurs he should receive an injection of a fresh solution of 1 to 1000 epinephrine or adrenalin, varying from 0 2 to 1 cc. according to the severity of the reaction and the age of the patient This dose should be repeated every five to thirty minutes until symptoms are relieved. If reactions occur after the patient leaves your office he should take 1 or 2 25-mg ephedrine capsules (which he should carry with him) and immediately return to your office for adrenalin therapy. A tourniquet applied above the site of injection loosened momentarily every few minutes and kept in place for twenty to thirty minutes will lessen the degree of reaction.

If the patient has had a constitutional reaction, the subsequent dose should be smaller than the one which produced the reaction. Thereafter the treatment may have to be increased more slowly than is indicated in the schedule

During the pollen season, tolerance for the larger doses may be impaired as evidenced by increasing local reactions or the production of symptoms by the injections. Co-seasonal therapy is then indicated with small doses (0.1 cc) of the 1 to 50, 1 to 500, 1 to 5000 or weaker dilutions. Very weak antigens often are necessary if [illegible] to three days.

[illegible] As symptoms

[illegible] may again be

increased as rapidly as tolerance permits

FOOD DIARY

FOOD	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
Cereals																												
Meats																												
Vegetables																												
Fruits																												
Dairy Products																												
Miscellaneous																												
Symptoms	Record below days on which symptoms occur																											
	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S

; can be listed on the left hand side of the chart and checks made on days they
m The symptoms can be listed under "symptoms" and the days they occur
indicated by checks

Schedule II for Antigen Therapy—(*Continued*)

15th	injection	0.30 cc. (5/100 cc.)	of dilution	1-500*
16th	"	0.35 cc.	"	"
17th	"	0 40 cc.	"	"
18th	"	0.45 cc.	"	"
19th	"	0 05 cc.	"	1-50
20th	"	0 075 cc.	"	"
21st	"	0.10 cc.	"	"
22d	"	0.125 cc.	"	"
23d	"	0.15' cc.	"	"
24th	"	0.175 cc.	"	"
25th	"	0.20 cc.	"	"
26th	"	0 225 cc.	"	"
27th	"	0 25 cc.	"	"
28th	"	0 275 cc.	"	"
29th	"	0 30 cc.	"	"
30th	"	0 325 cc.	"	"
31st	"	0.35 cc.	"	"
32d	"	0 375 cc.	"	"
33d	"	0 40 cc.	"	"
34th	"	0 425 cc.	"	"
35th	"	0 45 cc.	"	"
36th	"	0 475 cc.	"	"
37th	"	0 50 cc.	"	"
38th	"	0 525 cc.	"	"
39th	"	0 55 cc.	"	"
40th	"	0 575 cc.	"	"
41st	"	0 60 cc.	"	"

Continue with this last dose at weekly intervals until all the 1-50 dilution is exhausted.

If a local reaction larger than 3 inches in diameter occurs within twenty-four hours, the dose should be repeated at the next treatment. If a constitutional reaction occurs, the dose should be reduced to the previous one or smaller if the reaction is very severe. If no local reaction occurs, the treatment can be carried out faster than indicated, by skipping alternate doses, providing the injections do not activate or exaggerate symptoms. Modification of treatment during the pollen season is discussed in the general directions.

Supplemental Schedule for More Dilute Solutions
Schedule for Antigen Therapy

(Antigen to be administered subcutaneously every __________ days with a tuberculin syringe and a 26 gauge ½ inch hypodermic needle)

1st	injection	0 10 cc (1/10 cc)	of dilution	1-5,000,000
2d	"	0 20 cc.	"	"
3d	"	0 30 cc	"	"
4th	"	0 40 cc.	"	"
5th	"	0 50 cc.	"	"
6th	"	0 10 cc.	"	1-500,000
7th	"	0 20 cc.	"	"
8th	"	0 30 cc.	"	"
9th	"	0 40 cc.	"	"
10th	"	0 50 cc.	"	"
11th	"	0 10 cc.	"	1-50,000
12th	"	0 20 cc.	"	"
13th	"	0 30 cc.	"	"
14th	"	0 40 cc.	"	"
15th	"	0 50 cc.	"	

Botanical Classification of Edible Plants (Vaughan)—*Continued.*

Family.	Genus.	Species.	Common name.
		Dicotyledones	
Cruciferæ	Brassica	oleracea gemmifera	Brussels sprout
		oleracea caulo-rapa	Kohlrabi
		oleracea botrytis	Cauliflower (Broccoli)
Rosaceæ	Rubus	nigrobaccus	Blackberry
		occidentalis	Black raspberry
		strigosus	Red raspberry
	Fragaria	chiloensis	Strawberry
Pomaceæ	Malus	sylvestris	Apple
	Pyrus	communis	Pear
Drupaceæ	Prunus	amygdalus	Almond
		domestica	Plum, prune
		avium	Cherry
		armeniaca	Apricot
		persica	Peach
Leguminosæ	Pisum	sativum	Pea
	Phaseolus	vulgaris	Kidney bean
		lunatus	Lima bean
	Lens	esculenta	Lentil
	Acharis	hypogæa	Peanut
Rutaceæ	Citrus	limonia	Lemon
		grandis	Grapefruit
		sinensis	Common orange
Anacardiaceæ	Pistacia	vera	Pistachio nut
Vitaceæ	Vitis	vinifera	Grape, raisin
Malvaceæ	Gossypium	hirsutum	Cotton seed
		barbadense	
	Hibiscus	esculentus	Okra, gumbo
Sterculiaceæ	Theobroma	cacao	Cocoa
Theaceæ	Thea	sinensis	Tea
Umbelliferæ	Daucus	carota	Carrot
	Pastinaca	sativa	Parsnip
	Apium	petroselinum	Parsley
		graveolens	Celery
Vacciniaceæ	Gaylussacia	resinosa	Huckleberry
	Vaccinium	macrocarpon	Cranberry
Oleaceæ	Olea	europœa	Olive
Convolvulaceæ	Ipomœa	batatas	Sweet potato
Solanaceæ	Solanum	tuberosum	Potato
		melongena	Eggplant
	Lycopersicum	esculentum	Tomato
Rubiaceæ	Coffea	arabica	Coffee
Cucurbitaceæ	Cucurbita	pepo	Pumpkin
		moschata	Winter squash
		maxima	Hubbard squash
	Cucumis	melo	Cantaloupe
		sativus	Cucumber
	Citrullus	vulgaris	Watermelon
Compositæ (Chichoriaceæ)	Lactuca	sativa	Lettuce
	Tragopogon	porrifolius	Salsify, oyster plant
	Chicorium	intybus	Chicory
		endiva	Endive
Compositæ (Asteraceæ)	Helianthus	tuberosus	Jerusalem artichoke
	Cynara	scolymus	Artichoke

Ellis* (1931) published the following supplement to Vaughan's genetic classification of food allergens:

* Ellis, R. V.: Rational Grouping of Food Allergens, Jour. Allergy, 9, 246, 1931.

Food Protein Groups* (Vaughan)

1. Walnut
   Pecan
2. Swiss chard
   Beet
   Spinach
3. *Radish*
   Turnip
   Cabbage
   Cauliflower
   Mustard
4. Blackberry
   Strawberry
   Raspberry
5. Almond
   Cherry
   Apricot
   Plum
   Peach
6. Pea
   Lima bean
   Kidney bean
   Lentil
   Peanut
   String bean
7. Lemon
   Orange
   Grapefruit
8. Grape
   Okra
9. Cocoa
10. Parsley
    Celery
    Parsnip
    Carrot
11. Sweet potato
12. Tomato
    Potato, Irish
    Eggplant
13. Pumpkin
    Squash
    Cantaloupe
    Cucumber
    Watermelon
14. Lettuce
    Artichoke
15. Rye
16. Wheat
17. Barley
18. *Oat*
19. Rice
20. Corn
21. Onion
    Garlic
    Asparagus
22. Banana
    Ginger
23. Apple
    Pear

* Test solutions 23 to 28 represent animal foods.

Botanical Classification of Edible Plants (Vaughan)

Family.	Genus.	Species.	Common name
		Monocotyledones.	
Gramineæ	Triticum	sativum	Wheat
	Secale	cereale	Rye
	Hordeum	vulgare	Barley
	Avena	sativa	Oat
	Oryza	sativa	Rice
	Zea	mays	Corn
Palmaceæ	Cocos	nucifera	Cocoanut
	Phoenix	dactylifera	Date
Bromeliaceæ	Ananus	sativus	Pineapple
Liliaceæ	Allium	cepa	Onion
		sativum	English garlic
	Asparagus	officinalis	Asparagus
Musaceæ	Musa	sapientum	Banana
Zinziberaceæ	Zinziber	officinale	Ginger
		Dicotyledones	
Moraceæ	Morus	nigra	Black mulberry
	Ficus	carica	Fig
Polygonaceæ	Fagopyrum	vulgare	Buckwheat
	Pheum	rhaponticum	Rhubarb
Juglandaceæ	Juglans	nigra	Black walnut
		regia	English walnut
	Carya	olivæformis	Pecan
		alba	Hickory
Betulaceæ	*Corylus*	avellana	*Hazelnut, filbert*
	Castanea	dentata	*Chestnut*
Chenopodiaceæ	Spinacia	oleracea	Spinach
	Beta	vulgaris	Beet
		cycla	Swiss chard
Grossulariaceæ	Ribes	vulgare	*Currant*
		ocyacanthoides	Gooseberry
Cruciferæ	Raphanus	sativus	Radish
	Radicula	armoracia	Horseradish
		nasturtium	
		aquatium	Water cress
	Brassica	rapa	Turnip
		campestris	Rutabaga
		alba	White mustard
		nigra	Brown mustard
		oleracea capitata	Cabbage
		oleracea acephala	Kale

Vertebrata.
Class—Pisces.

Common name	Synonym.	Family.	Genus.	Species.
Crappie		Centrarchidæ	Pomoxis	annularis
Calico bass	Strawberry bass	"	"	sparoides
Rock bass	Goggle eye	"	Ambloplites	rupestris
Bluegill	Blue sunfish	"	Lepomis	pallidus
Butterfish	Harvestfish	Stromateidæ	Pronotus	triacanthus
Harvestfish	Whiting	"	Peprilus	paru
Buffalo, common		Catostomidæ	Ictiobus	cyprinella
Buffalo, white		"	"	bubalus
Drum	Lake carp	"	Carpoides	thompsoni
Sucker, common	White sucker	"	Catostomus	commersoni
Catfish, blue	Mississippi cat	Siluridæ	Ictalurus	furcatus
Channel cat	Spotted cat	Siluridæ	Ictalurus	punctatus
Codfish		Gadidæ	Gadus	callarias
Haddock		"	Melanogrammus	aeglefinus
Flounder (Atlantic)		Pleuronectidæ	Glyptocephalus	cynoglossus
Flounder (Atlantic)		"	Pleuronectes	americanus
Flounder (Pacific)		"	Platichthys	stellatus
Halibut (Atlantic or Pacific)		"	Hippoglossus	hippoglossus
Halibut (Pacific)		"	Paralichthys	californicus
Pike, wall eyed	Jack salmon	Percidæ	Stizostedion	vitreum
Pike, sand	Sauger	"	"	canadense
Perch, yellow	Ringed perch	"	Perca	flavescens
Pickerel	Common pike	Esocidæ	Esox	lucius
Muskellunge			"	masquinongy
Herring, common		Clupeidæ	Clupeus	harengus
Herring	California herring	"	"	pallasii
Shad, common		"	Alosa	sapidissima
Sardines	Spanish sardine	"	Clupandon	pseudohispanicus
Sardines	California sardine	"	"	ceruleus
Smelts, American		Argentinidæ	Osmerus	mordaxchthys
Smelts, California		"	"	thaleichthys
Sturgeon, common		Acipenseridæ	Acipenser	sturio
Salmon, pink		Salmonidæ	Oncorhynchus	gorbuscha
Salmon, red	Sockeye salmon	Salmonidæ	Oncorhynchus	nerca
Salmon, red	Chinook salmon	"	"	tschawytscha
Whitefish	Common whitefish	"	Coregonus	clupeiformis
Lake herring	Cisco	"	Argyrosomonas	artedi
Bloater	Silver whitefish	"	"	prognathus
Trout	Rainbow trout	"	Salmo	irideus
Trout	Speckled trout	"	Salvelinus	fontinalis
Lake trout	Mackinaw trout	"	Cristovomer	namaycush
Lake trout	Siscowet	"	"	siscowet
Weakfish	Sea trout	Sciænidæ	Cynoscion	regalis
Mackerel	Common mackerel	Scombridæ	Scombrus	scombrus
Mackerel	Chub mackerel	"	"	japonicus
Tuna fish		"	Thunnus	thynnus
Mackerel	Spanish mackerel	"	Scomberomorus	maculatus
		Class—Amphibia		
Frog	Bull frog	Ranidæ	Rana	catesbiana
		Class—Reptilia.		
Turtle	Troosts turtle	Testudinidæ	Chrysempys	troosti
Turtle	Diamond back terrapin	"	Malacoclemmys	palustris
		Class—Aves.		
Chicken		Gallinæ	Gallus	domesticus
Turkey		"	Meleagris	gallopavo—bronze
Turkey		"	"	americana—black
Goose		Anserinæ	Anser	anser
Duck			Anas	domestica
Guinea			Numida	meleagris
Squab		Columbæ	Columba	livia
Quail		Perdicidæ	Ortyx	virginiana
Quail, mountain		"	Oreortyx	pictus
Quail, California		"	Lophortyx	californicus
Grouse		Tetraonidæ	Tetrao	cupido—prairie chicken
		"	Bonasa	umbellus

PLANTS.

Common name.	Family.	Genus.	Species.
	Monocotyledones.		
Sorghum	Gramineæ	Holcus	sorghum
Leek	Liliaceæ	Allium	parrum
Chive	"	"	schoenoprasum
	Dicotyledones.		
Hops	Moraceæ	Humulus	lupulus
Hazelnut	Betulaceæ	Corylus	americana
Blueberry	Ericaceæ	Vaccinium	corymbosum
Dewberry	Rosaceæ	Rubus	flagellaris
Tangerine	Rutaceæ	Citrus	nobilis
Maple sugar	Aceraceæ	Acer	saccharum
Green and red pepper	Solonaceæ	Capsicum	frutescens
Ground cherry	"	Physalis	pubescens
Yam	Dioscoreaceæ	Dioscorea	batatas
Dill	Umbelliferæ	Anethum	graveolens

EDIBLE ANIMALS.

Invertebrata.
Phyllum Mullusca.

Common name.	Class.	Family	Genus.	Species
Abalone (red)	Gastropoda	Haliotidæ	*Haliotis*	rufescens
Abalone (green)	"	"	"	*fulgens*
Snail (edible)	"	Helicidæ	Helix	pomatia
Mussel, salt water	*Pelecypoda*	Mytilidæ	Mytilus	edulis
Mussel, fresh	"	Unionidæ	Unio	(several sp.)
Mussel, fresh	"	"	Anodonta	(several sp.)
Oysters	"	Ostreidæ	Ostrea	virginica
Oysters	"	"	"	lurida
Scallops (common)	"	Pectinidæ	Pecten	irradians
Scallops	"	"	"	islandicus
Scallops (giant)	"	"	"	magellanicus
Clams (soft shell)	"	Myidæ	Mya	arenaria
Clams, razor	"	Solenidæ	Ensis	viredis
Clams, round	"	Veneridæ	Venus	mercenaria
Squid	Cephalopoda	Loliginidæ	Loligo	pealei

Phylum Arthropoda.
Class—Crustacea.

Common name.	Family	Genus.	Species.
Lobster	Nephropidæ	Homarus	americanus
Lobster (European)	"	"	homarus
Lobster (Norwegian)	"	Nephrops	norwegini
Lobster (Spanish)		Scyllarides	sculptus
Crayfish	Astacidæ	Astacus	nigrescens
Crayfish	"	Cambarus	limosus
Shrimp	Crangonidæ	Crangon	vulgaris
Shrimp, California	"	"	franciscorum
Prawn	Palaemonidæ	Palaemon	vulgaris
Prawn	"	"	serratis
Sou. shrimp and prawn	Peneidæ	Peneus	setiferus
Spiny lobster (Florida crayfish)	Palinuridæ	Palinurus	argus
Crabs, rock	Canceridæ	Cancer	irroratus
Crabs, Jonah	"	"	borealis
Crabs, California	"	"	magister
Crabs, blue	Portunidæ	Callinectes	sapidus
Crabs, lady	"	Ovalipes	ocellatus

Vertebrata.
Class—Pisces

Common name.	Synonym.	Family	Genus	Species.
Anchovy, western		Engraulidæ	Anchovia	delicatissima
Anchovy, California		"	Engraulis	mordax
Bass, black, small mouth		Centrarchidæ	Micropterus	dolomieu
Bass, black, large mouth		"	"	salmoides

intradermally. If both these tests are negative, 0.10 cc. of undiluted serum may be given subcutaneously, and in twenty minutes, if no local or general reaction is evident, the immunizing dose may be injected or intravenous serum may be started. It should be given slowly so that evidences of an allergic reaction not indicated by skin reactions or previous history can be recognized.

Alexander also suggests the following additional test when a large amount of serum must be given intravenously and a negative skin reaction is obtained. One cc. of serum should be injected subcutaneously. If, in fifteen to twenty minutes, no reaction has occurred, the total amount may be administered.

If an immediate scratch reaction occurs, especially with a history of inhalant allergy to horse dander, serum therapy at times, even when given with the following precautions, is impossible because of the severity of the reaction. In these patients anti-serum from cattle or rabbits may be tolerated. Preliminary tests as outlined in this article and similar care in the injection of such serum, however, are as necessary as with horse serum. When such sera are not available and when the danger of tetanus, diphtheria, or other diseases is great, the administration of horse serum may be attempted as follows: Scratch or puncture tests should be made with serum dilutions of 1 to 1000, 1 to 10,000, 1 to 100,000 and 1 to 1,000,000. In thirty minutes 0.10 cc. of the dilution which gives no reaction whatsoever can be given intradermally. In extremely sensitive patients a 1 to 1,000,000 or even 1 to 10,000,000 solution might be necessary. In thirty minutes if there is no local reaction larger than ¼ inch in diameter and there is no evidence of respiratory or cutaneous allergy, 0.10 cc. of the same dilution can be given subcutaneously. Every twenty minutes thereafter the dose may be increased as suggested below. Doses may be skipped if increasing evidence of tolerance or desensitization to the serum arises The initial dose depends on the skin reaction as noted above. All injections should be given in an extremity so that a tourniquet can be applied above the injected area if a rapid allergic reaction arises.

As already stated, the injections may be given faster or slower than is suggested in the schedule, according to the patient's local and general response. Slow administration is tedious; but if it prevents serious or fatal disease in the extremely sensitive or naturally allergic patient, it is justified If the entire schedule as suggested is necessary, twenty-four hours or longer may be required. As stated before, a rare patient develops a severe or even fatal reaction from a very dilute serum. Kojis recently reported 1 death in every 1042 injections of horse serum in contrast to Park's older report of 1 death in every 50,000 injections.

If the scratch reaction is negative and the ocular or the first intradermal test is positive, the injections may be given according to the above schedule starting with the dilution which fails to react by the intradermal test. According to the degree of resultant allergy, the speed of increase must be slower or faster than the printed schedule.

Class—Mammalia.

Common name.	Order.	Family.	Genus	Species
Beef	Ungulata	Bovidæ	Bos	taurus
Beef (buffalo)	"	"	"	bison—buffalo
Beef	"	"	"	indicus—Indian cattle
Mutton	"	"	Ovis	aries
Goat	"	"	Capra	?
Reindeer, caribou	"	Cervidæ	Cervus	tarandus
Rabbit	Rodentia	Leporidæ	Lepus	sylvaticus—*U. S.* cottontail
Rabbit	"	"	"	americanus—American hare
Squirrel	"	Sciuridæ	Sciuris	hudsonicus—red squirrel
Squirrel	"		"	carolinensis—gray squirrel
Squirrel	"		"	niger—fox squirrel

COMPARISON OF UNIT VALUES OF POLLEN EXTRACTS
(According to Tuft)*

Comparable Values of Pollen Extracts

By weight of pollen (Noon unit in 0 001 mg pollen)	*By total nitrogen* (Kjeldahl)	*By protein nitrogen* (Cooke & Stull) units
1 cc. of 1 1,000,000 (1 Noon unit)	0 000016	0 64
1 cc. of 1 100,000 (10 units)	0 00016	0 4
1 cc of 1:10,000 (100 units)	0 0016	64
1 cc. of 1:1000 (1000 units)	0 016	640
1 cc. of 1:100 (10,000 units)	0 16	6400

SERUM ADMINISTRATION AND REACTIONS

Before injecting serum, every patient should be tested for possible serum allergy. Special care is necessary in patients with an allergic history, especially of asthma or nasal allergy, and particularly of nasal or bronchial symptoms arising in proximity to horses, mules, or even to other animals † An occasional patient who apparently inherits "natural" horse dander or serum allergy may rapidly develop severe asthma, anaphylactic shock, and may even die with the injection of 1/1000 cc. of serum Since allergy frequently develops after serum therapy, the number and amount of previous injections of serum must be determined. Acquired sensitization from previous serum therapy or toxin-antitoxin immunization usually produces less serious reactions than arise in animal-dander-sensitive patients.

Before serum therapy, a scratch or needle puncture test with undiluted serum should be done. Normal horse serum according to Alexander, should be used, since immune serum may produce a false positive reaction (E-E reaction). Such normal serum for testing should accompany all therapeutic sera. If negative in twenty minutes, a drop of serum diluted 1 to 10 with saline solution should be dropped into the eye and 0.02 cc. of serum (diluted to 1 to 100 with sterile saline) should be injected

* Tuft, L.: Clinical Allergy, W. B. Saunders Company, Philadelphia, 1937

† Patients known to be allergic to animal emanations and sera should be immunized to diphtheria and tetanus with alum precipitate toxoids to prevent future emergency serum therapy.

such products may vary from year to year. The government requirement that the ingredients of food products must be printed on wrappers or labels is helpful to patients but their absolute accuracy and the various ingredients listed below must be questioned in many instances

Baby Foods

Th[illegible]inz, Libby, and Stokley offer a [illegible] puréed fruits, cereal products, [illegible] Vegetables contain only added salt, but the ingredients of other products are printed on the labels.

Borden's Malted Milk—barley malt, wheat flour, whole milk; *Carnrick's Soluble Food*—malted wheat, dried milk, milk sugar; *Diastased Farina*—malted cereal food; *Dryco*—irradiated dried milk, *Dryco (Special)*—rice "polish," vitamin B_1 irradiated milk; *Farina*—wheat; *Goat's Milk*—canned and evaporated by Meyenberg Co, California; *Horlick's Malted Milk*—barley, wheat flour, dried whole milk, malt, $NaHCO_3$; *Karo Syrup*—corn syrup; *Kreme O'Soy*—soy beans, soy oil, calcium phosphate [illegible]

[illegible]um—wheat meal, oatmeal, cornmeal, yeast, beef bone, iron, and salt; *Similac*—cow's milk, olive oil, cocoanut oil, cod-liver oil, olive oil lactose, *Stokley's Strained Baby Cereal*—cereal grains, milk, soy bean, salt, yeast, *Sobee*—soy bean, olive oil, arrowroot starch, dextri-maltose, dicalcium phosphate.

Beverages
(*Non-alcoholic*)

Soft drinks contain cane, beet, or corn sugars, colored with artificial or natural colors and flavored with fruit juices or with natural, synthetic, essential oils, usually in carbonated water.

Coca-Cola—caffeine, caramel, essential oils (cinnamon, coriander, lemon, neroli, nutmeg, sweet orange), glycerin, lime juice, phosphoric acid, soluble extracts of coca leaves or kola nuts and water (carbonated), *Cocamalt*—dried skimmed [illegible] cocoa, barley malt, [illegible] B_1 and D, *Coffee*—o[illegible] nuts or grains (see p. [illegible] ginger extract) and [illegible] on and citric acid), capsicum extract is frequently substituted in part for ginger; *Ovaltine*—barley malt, dried egg and milk, cocoa, salt, flavoring, supplemental Ca, P, Fe, vitamins A, B_1 and C; *Root Beer*—an extract containing a fermented infusion of root bark and herbs containing essential oils such as sarsaparilla, birch, spruce, wild cherry, spikenard, wintergreen, anise, cassia cloves, lemon, coumarin, vanilla, ginger, with sugar and yeast added and may contain egg to increase foaming; *Sarsaparilla*—caramel, cologne spirits, oils of anise, orange, sassafras, wintergreen, powdered pumice stone, sugar and water.

Beverages
(*Alcoholic*)

Beer (Ale, Stout, Porter)—fermented malted grain, usually barley, though wheat, rye, oats, rice, and corn may be used. Hops (dried flower of the hop vine) are usually added; *Brandy*—distilled from fermented juices of grapes or from peaches, cherries, apricots, apples, and other fruits; *Gin*—distilled from a mixture of wheat, barley, malt, rye and corn. The following flavors may be used: angelica root or seed, aniseed, calamus, caraway, cardamom, cassia (cinnamon), coriander,

Dilution of serum	Amount injected, cc.	Dilution of serum	Amount injected, cc.
1:100,000,000	0.10	1:100	0.10
"	0.20	"	0 20
"	0 40	"	0 40
1:10,000,000	0 10	"	0.60
"	0 20	1:10	0 10
"	0 40	"	0.20
1:1,000,000	0.10	"	0 40
"	0 20	"	0.60
"	0 40	Undiluted	0 05
1:100,000	0 10	"	0.10
"	0 20	"	0.15
"	0 40	"	0 20
1:10,000	0 10	"	0.30
"	0 20	"	0 40
"	0 40	"	0.60
"	0 60	"	0.80
1:1,000	0 10	"	1 00
"	0 20	"	1.50
"	0 40	"	2 00
"	0 60	"	etc.

Therapy of immediate reactions: Epinephrine or adrenalin, 1 to 1000, must be immediately available during all serum therapy. Doses of from 0.20 to 1.00 cc. according to age and degree of reaction, may be given subcutaneously every ten to sixty minutes and every one to six hours thereafter until such clinical reactivity subsides. Histaminase, 10 to 30 units three to four times a day may be given by mouth with possible relief to the serum allergy.

Therapy of delayed serum reactions: Erythema, urticaria, angioneurotic edema, pruritus, joint pain, gastro-intestinal symptoms, fever, and the other recognized results of serum disease may occur in a few hours to eight to ten days after the injection. Histaminase in doses noted above may gradually produce relief. Epinephrine or adrenalin subcutaneously in doses as suggested above may also be necessary for one to eight days. At times 1 to 100 epinephrine by inhalation or ephedrine by mouth may be sufficient For pruritus, colloidal-soda baths (see page 117), carbolized calamine lotion, or other soothing lotions may be helpful.

Additional serum therapy may be administered providing the interval does not exceed five days. A longer time between injections may lead to the development of serum allergy. Patients who developed allergic manifestations after previous serum injections should be reinjected as advised above.

USUAL INGREDIENTS IN VARIOUS COMMERCIAL FOODS AND THEIR PRODUCTS

Patients on Elimination or other trial diets must eat no commercial or prepared mixtures of foods unless all ingredients have been actually added to their diets by their physicians. The ingredients in the foods listed below have been obtained from textbooks by Tuft* and Vaughan† and from original sources. Contents of

* Tuft, L.: Clinical Allergy, W. B. Saunders Company, Philadelphia, 1937.
† Vaughan, W. T.: Practice of Allergy, Mosby & Co., St Louis, 1939.

Canned Fruits

Most canned fruits contain the separate fruit with or without granulated (cane or beet) sugar. *Corn* glucose is occasionally used. The Del Monte products, for instance, are all canned with cane or beet sugar except for figs, to which a little corn syrup is added The contents must be determined from the label or the company

Canned Vegetables

Vegetables are canned in water with salt added for seasoning. Artichokes contain citric acid.

Cereals

Naturally occurring cereal products and flours are discussed on pages 60 to 62. *Beemax*—rye, barley and wheat germ; *Berger's Food*—wheat flour and pancreatic extract, *Brittle Bits*—malted wheat and barley; *California Wheatine*—wheat; *Cerealine Flakes*—corn; *Corn Flakes*—corn, malt extract, sugar and salt; *Cream of Wheat*—Farina with added wheat embryo, Ca, P and Fe; *Cream of Rice*—rice and powdered milk; *Dino-Mite*—oats, bran, flax; *Falona*—wheat, oats, barley, and bean flour; *Force*—malted wheat and barley; *F. S. Granulated Hominy*—corn; *Farina*—wheat; *Grape Nuts and Flakes*—whole wheat flour, malted barley flour, yeast, salt; *Grape Nuts Wheat Meal*—whole wheat, thiamin, sugar, salt, flavoring; *Hecker's Hominy*—corn, *H O. Co. Hominy*—corn; *Kix (Gold Medal)*—cornmeal, tapioca, wheat germ, sugar, salt, vegetable oil, phosphates, iron, vitamins B_1 and G; *John Bull Foods*—dried milk and cereals; *Macaroni*—wheat and milk (rice macaroni made by Chinese); *Maltine*—malted barley, wheat, oats, vitamins B and C; *Malt-O-Meal*—farina, toasted malt barley; *Mazuma*—corn; *Muffets*—whole wheat, *Nichol's Snow Whites*—corn; *New Pettijohn's*—whole wheat; *Nutro*—cereal and peanut flour; *Pillsbury's Vites*—wheat; *Popcorn*—[illegible] [illegible] flavoring; *Quaker's Crackels*—corn, wheat, oats; *Quaker's Farina*—wheat; *Quaker's Oats*—oats; *Quaker's Crackles*—wheat, oats, brown sugar, salt, *Ralston's Health Breakfast Food*—wheat. *Rice Biscuits*—(Battle Creek Food Co)—rice, yeast, sugar, salt; *Roman Meal*—ground flaxseed, rye, wheat, bran, salt; *Savoy and Moore's Food*—wheat flour and malt; *Sperry Wheat Hearts*—farina with wheat germ added; *Spaghetti*—wheat and milk; *Steinhardt's Infortina*—diastased cereals, dried milk, lactose cane sugar; *Swan's Potato Starch Flour*—potato, U. S *Health Food*—ground flaxseed.

Prepared Flour

The ingred[illegible] rising flou[illegible] fore, is su[illegible] shortening[illegible] endosperr[illegible] contains

Cheeses

(See discussion of cheeses on page *67*)

American Brie, Camembert, Cheshire, Cheshire Stilton, Edam, Emmenthaler, Gorgonzola, Gammalost, Gruyère, Limburger, N[illegible] and Stilton—all from cow's [illegible] —goat's milk, *Gorgonzola*—c[illegible] —tame buffalo's milk; *Lip*[illegible] *Mantana*—cow's or goat's m[illegible] —sheep's milk. [illegible] and spices;

fennel, juniper berries, lemon peel, licorice root, nutmeg, orange peel, sweet orange, neroli (extract of orange blossom), orris root, sloe berries, turpentine in any combination; *Liqueurs*—sweet liquors made by distilling and mixing various alcohols with essential oils, flavors, and syrups; *Rum*—distilled from cane sugar products; *Whiskey*—distilled from malt, corn, rye, and other cereals. *"Sake"*—Japanese beer made from rice; *Wines*—fermented fruit juices, usually grapes (see page 81).

Bread

Glazing of crusts done with egg and at times with milk. Buckwheat flour is used on the bottom of some breads to prevent burning. The kind of oil, shortening or grease used on the pan and in the bread must be determined from each baker or cook.

Buckwheat Bread—buckwheat, wheat, yeast, and salt and other flours. Milk and egg at times are added; *French Bread*—Cassou's Sour French—salt, water, yeast, malt, and flour; Cassou's Sweet French—salt, water, milk, yeast, malt, and flour; *Hausbrot* or *Tafelbrot*—wheat and rye; *Knupfel*—rye and wheat; *Kommisbrot*—rye (rye flour may have some added wheat); *Lima Bean Bread*—commercial product contains lima bean flour, wheat flour, milk, egg, salt, yeast, in varying proportions (see page 233 for recipe for bread to be used with elimination diets). [illegible] yeast, salt; *Pumpernickel*—coarse rye [illegible] cent), malt, salt, caramel coloring [illegible] mpernickel contains wheat flour; *Rice Bread*—wheat, rice, potato and often milk; *Rye Bread*—rye, wheat, yeast, and often milk (see page 237). *Roman Meal Bread*—ground flaxseed, wheat, milk, and salt; *Ry-Krisp* (Ralston Company)—whole rye, salt water; *Soy Bean Bread*—commercial product contains soy bean flour, wheat flour, gluten (wheat) flour, milk, egg, salt, yeast in varying amounts. (For use with elimination diet, see recipes on page 233.) *"Hollywood Bread"*—wheat flour, malt, yeast, salt, honey, caramel, whole rye, oatmeal, soya, gluten, and barley flours, sesame seed, dehydrated vegetables—celery, lettuce, pumpkin, cabbage, carrot, spinach, parsley, sea kelp. *Cassou's Vita-Meal Bread*—wheat, rye, honey, yeast, shortening, oatmeal, sugar, salt, flaxseed, skim milk, malt; *White breads*—wheat flour, sugar, shortening (of various kinds), milk, yeast, salt, molasses may be used; *Bill Baker's Soy Bean Bread*—wheat flour, soy bean flour, skimmed milk, vegetable shortening, honey, salt, yeast; *Potato Bread*—wheat flour, potato flour, milk, shortening, salt, yeast, sugar.

Candy and Confectionery Products

The inclusion of chocolate, egg albumen, milk, and butter in varying amounts in most of these products must be remembered. The salesgirl in candy shops rarely knows the ingredients of her merchandise. Only the candy maker, himself, has this information. By law, it should be printed on all candy containers. In addition, cane or beet sugar, corn syrup, honey, molasses, cocoanut oil, palmnut oil, yeast, salt, agar-agar, gum arabic (acacia), gum tragacanth, karaya gum, glycerin, artificial color, cocoanut, nuts of various kinds, fruits, raisins, soy albumen, cream of tartar, various flavors and essential oils, are utilized in varying combinations by different manufacturers. [illegible] forbidden when patients are on elimination [illegible] oduct die[illegible] in the in[illegible] elimination diet (see recipes on pages [illegible]).

Canned Fish

Much fish is packed in various vegetable oils. Spices, at times, are added. It is important to know the exact nature of such oils, spices, etc., before they are eaten by any allergic patient.

(see pages 86 and 87). *Potato Chips*—usually fried in cottonseed oil, also in corn, cocoanut, peanut or other edible oils; *Salad Oil*—usually cottonseed oil, though corn, peanut, sesame or other edible oils occasionally may be present; *Spices*—described and listed on pages 85, 86 and 226. *Syrups*—combinations of corn and maple syrup and cane sugar; *Vinegar*—dilute acetic acid from fermentation of alcohol, apple or cider vinegar most common; wine or grape vinegar, beer vinegar in England, sugar vinegar from molasses, glucose vinegar from corn syrup, and white vinegar from dilute alcohol; dilute acetic acid may be used by allergics (3 teaspoonfuls of 28 per cent acetic acid to 5 ounces of water); *Wesson Oil*—cottonseed oil; *Worcestershire Sauce*—vary in content [illegible] juice, onio[illegible] and spices [illegible] rye, or barley malt. Actual ingredients of the brand used may be learned from the manufacturer.

Dressings and Mayonnaise

Best Foods French Dressing—oil, vinegar, salt, tomato, spices, tragacanth, and egg yolk; *Cream Sauce*—butter, flour, milk, eggs, flavors; *French Dressings*—olive or salad oil, vinegar, salt, pepper, spices, tragacanth; *Girard's French Dressing*—oil, vinegar, salt, spices, garlic; *Hollandaise*—eggs, butter, lemon juice; *Mayonnaise*—olive or salad oil, eggs, vinegar, spices, sugar, and salt; *Miracle Whip Salad Dressing*—cottonseed and corn oil, vinegar, spices, sugar, salt, eggs, arrowroot, and cornstarch; *Tartar Sauce*—mayonnaise, capers, olives, cucumber, pickles, spices; *White Sauce*—butter, flour, milk, seasoning

Seasoned and Spiced Foods

(For pure spices, see pages 85, 86 and 226)

Chutney—East Indian pickle, usually with mangoes, raisins, tamarinds, limes, ginger, chilis, and other spices Domestic chutneys contain some sweet acid fruit such as lemon or tamarinds seasoned as above; *Chow Chow*—a mixture of pickled vegetables and mustard; *Curry*—a highly seasoned East Indian condiment, usually containing tumeric, coriander, black pepper, cayenne pepper, fenugreek seed, cumin, ginger and lime, *Enchilades*—corn, wheat flour, beef, pork, onions, garlic, chili, tomato paste, cheese, eggs, olives. *Minced Meats*—apple, raisins, spices, brandy, sherry, rum, [illegible] co[illegible] m[illegible] cc[illegible] spices, *Mushroom Sauce*—[illegible] flour, beef [illegible]

Meat Products

Bologna—beef, veal, pork, spices, onion Casings of this and similar products may contain egg. *Calves' Feet*—gelatin, citric acid, sugar, and wine; *Corned Beef*—beef treated with salt and saltpeter, sugar, and various spices such as allspice, coriander, mace, nutmeg, thyme, and sage; *Deviled Meats*—beef, pork, pepper, onion or garlic, cloves, paprika, mustard, coriander, mace, anise, and other spices in varying amounts, *Frankfurters*—beef, pork, at times veal, milk, or cereals, onions, and spices stuffed in sheep casings, *Goose Liver*—calf's liver, pork, goose liver; *Pâté de Foie Gras*—goose liver, truffles, spices; it usually contains pork; *Salami*—pork, beef, grape juice, garlic, spices; *Salmagundi*—chopped meat, fish, anchovies, onions, pickles, vinegar, pepper and other ingredients, *Sausages*—chopped meat, usually beef or pork, cured, spiced and stuffed in beef, sheep, or hog casings; often contain potato, rice, wheat, at times milk and egg; *Scrapple*—

Fermented Milk Products

Koumiss—fermented milk of mares or asses; also cow's milk fermented by yeast; *Kefir*—fermented cow's or goat's milk; *Leben*—cow's milk fermented by special coagulant.

Cookies and Crackers
(*Commercial*)

Many varieties are manufactured containing varying amounts of wheat, corn, milk, butter, egg, chocolate, lard, vegetable oils, soda, salt, yeast, flavors, coloring, molasses, sugar, corn syrup, and other ingredients. The pure food law now requires all ingredients printed on labels, and the manufacturer will always send such information on request. *Products are made by various companies free of egg, milk, or wheat.* Other ingredients must be known and must only be included in the patient's diet by the physician's order.

Desserts

Blanc Mange—Irish moss, milk, flavoring. *Cornstarch*—ground rice and arrowroot are often used; *Custard*—eggs, milk, sugar, flavoring; *D-Zerta*—gelatin, citric acid, saccharine, various fruit flavors and food colorings; *Fritters*—flour, baking powder, egg, and milk; *Gelatin*—cattle, sheep, goat, pig, and fish hides and connective tissues (see page 70). *Knox gelatin*—said to be made from beef; *Jell-O*—from beef and pork; prepared flavored gelatin desserts contain sugar, gelatin, citric and tartaric acids, natural or synthetic flavors and coloring.

Ice Cream and Puddings

Genesee Royal and Jello Dessert Powders—(butterscotch) granulated sugar, cornstarch, brown sugar, butter, flavoring, salt, artificial color—(vanilla) sugar, corn- [illegible] and whole [illegible] alt, vanilla, [illegible] *am Powders* [illegible] ruit flavor, salt, karaya gum, coloring in varying amounts; *Ices*—fruit, egg, and flavoring (see Sherbet); *Junket, Danish Dessert*—sugar, tapioca, berry juices, flavoring, citric; *Kremel*—cornstarch, dextrose, sucrose; *Marshmallows*—may contain egg white; *Meringue*—egg, lemon, or other flavor, sugar; *Sherbet*—milk, fruit juice or flavor, and sugar.

Miscellaneous Foods and Pantry Supplies
Pantry Supplies

Baked Beans—beans, pork, catsup, bacon pork, vinegar, salt; *Baking Powder*—alkali, usually sodium bicarbonate combined with an acid such as phosphoric acid, aluminum sulfate, cream of tartar or tartaric acid. Cornstarch is the usual filler to prevent moisture absorption. *Royal, Shillings, K. C., and Calumet* contain no egg; *Beef juices*—meat juice, egg white; *Canned Tomato Soup*—tomato, butter, milk, onion, sugar, salt, flour, spices; *Catsup*—tomato, spices, onions, sugar, vinegar; *Cottolene*—cottonseed oil and beef suet; *C. & H. Confectioner's or Powdered Sugar*—contains 3 per cent cornstarch; *Crisco*—cottonseed oil, *Highland Maple Sap Syrup*—100 per cent maple syrup; *Log Cabin Maple Syrup*—cane sugar, maple syrup; *Jam and Jellies*—fruit and sugar, sometimes contain corn syrup; *Mazola Oil*—corn oil; *Maraschino Cherries*—artificial coloring and flavoring, sulphur dioxide, sugar, corn syrup; *Nucoa—Oleomargarine*—animal or vegetable fat churned in milk; *Olive Oil*—some brands are pure, others adulterated with other commercial oils

Canned Soups

As stated on page 138, these cannot be used in Elimination Diets unless every ingredient is ascertained from the manufacturer and all have been allowed by the physician Likewise hotel, restaurant soups, and those in friends' homes contain many ingredients of unknown or uncertain content. It must be remembered especially that consomme usually contains egg and tomato. Cream soups contain cream, butter, wheat flour, and usually pepper.

LIST OF HOUSEHOLD MATERIALS AND THE POSSIBLE ALLERGENS THEY CONTAIN*

POWDER PUFF:
- Chamois
- Sheep wool
- Lamb wool.

COMBS:
- Isinglass (air bladder of fish).

COSMETICS·

1 *Powders:*
- (*a*) Face Powders: orris root and rice starch most important bases used. Also used are arrowroot starch, barium sulfate, bismuth salts, chalk, kaolin, kieselguhr, lanolin, magnesium carbonate, maize starch, stearate of zinc, talc, zinc oxide.
- (*b*) Talcum Powders· bases used are American or Italian talc, boracic acid, cornstarch, *fuller's earth*, magnesium carbonate, orris root, zinc stearate and zinc oxide.

  Perfumes used are generally violet, carnation, and rose.

2. *Rouge:*
- (*a*) Solid contains talcum, *gum acacia, oils* of rose, lemon or bergamot.
- (*b*) Liquid: contains ammonia, rose water, essence of rose and carmine.
- (*c*) Cream· cold cream with coloring matter.

3. *Lipstick:* bases used are cetaceum, spermaceti, or paraffin. Coloring matters are carmine and eosin

4. *Manicure Preparations:*
- (*a*) Nail Polish: bases used are stannic oxide, kaolin, kieselguhr, zinc oxide, French chalk, pumice powder, precipitated chalk. [illegible] Carmine and [illegible]
- (*b*) Cu [illegible]
- (*c*) Cu [illegible]

5 *Bath Salts*· contain essentially alkaline carbonates usually sesqui-carbonate of soda Borax may also be present.

Perfumed with oils of citronella, lemongrass, lavender, rosemary, pine.

TOOTH POWDERS AND TOOTH PASTES:

Basic substances are chalk, calcium phosphate, orris root, kieselguhr, kaolin, magnesium carbonate, cuttlefish bone, pumice stone, bicarbonate of soda, borax, cream of tartar, powdered soap.

Flavored with oils of anise, bergamot, caraway, cassia, clove, cinnamon, eucalyptus, geranium, lavender, lemon, neroli, nutmeg, orange, peppermint, spearmint, rose and thyme, tincture of myrrh, *menthol*.

* Reprinted from Clinical Allergy, Louis Tuft, W. B. Saunders Company, 1937.

pork, cornmeal or buckwheat with spices and herbs; *Tripe*—inner lining of stomach, usually from beef but also from veal, sheep or hog; *Veal* or *Meat Loaf*—may contain veal, pork, beef, egg, flour, bread crumbs, onion, pepper, and spices in varying amounts. *Vienna Sausage*—pork, beef, spices, stuffed in sheep or hog intestinal casings.

Spices, Flavoring Herbs and Their Uses *

Allspice: whole, ground; Anise; Basil; Bay Leaf; Caraway Seed; Cardamom Seed: whole, decorticated, ground; Cassia: sticks, ground, buds; Cayenne; Celery: juice, seed; Chili: pods, powder; Cinnamon: sticks, ground; Cloves: whole, ground; Coriander: whole, ground; Cumin; Curry Powder; Dill; Fennel; Fenugreek; Garlic: juice, powder; Ginger: cracked, ground; Juniper Berries; Mace: blades, ground; Marjoram; Mustard: seed, flour; Nutmeg: whole, ground; Onion: dehydrated, juice; Oreganum; Paprika; Parsley: juice, seed; Pepper: whole, ground; Poppy Seed; Rosemary; Saffron; Sage; Savory; Sesame Seed; Tarragon; Thyme; Tonka Bean; Tumeric; Vanilla Bean

FOODS: Bread and Rolls; Cakes and Cookies; Candy; Canned Foods; Carbonated Beverages; Catsup and Chili Sauce; Cheese; Chili Con Carne; Condiment Sauces; Crackers and Biscuits; Fish (Packed); Fruit Preserves; Mayonnaise; Meats; Pickles; Pie Fillings; Poultry Seasoning; Salad Dressings; Sausages and Chopped Meats; Soups; Spice Extractives; Spice Oils

FEEDS AND MISCELLANEOUS: Cattle Feed; Chicken Feed; Cordials; Gin; Insecticides; Perfumes; Pharmaceuticals; Tobacco Products

* (Courtesy of Food Industries, 10, 423, 1938.)

Bedroom

Pillows:
Feathers—chicken, duck, goose, turkey, pigeon
Cotton
Kapok
Straw—wheat, rye, barley and rice
Animal hair—rabbit
Vegetable fiber—cotton

Blankets and Quilts:
Cotton, rayon
Wool
Animal hair—camel, goat, cow, dog, rabbit
Vegetable fiber—cotton

Straw Mats and Rugs:
Straw—wheat, rye, barley, rice and flax

Toys:
Animal hair—cat, rabbit (plush toys), cow
Rabbit skins
Sheep's wool—in doll's hair

Mattress:
Cotton
Kapok (silk floss)
Straw
Wool
Animal hair—horse, rabbit, cow
Feathers
Vegetable fiber—cotton

Bed Sheets and Linen:
Vegetable fiber—flax (linen)

Rugs—Domestic and Oriental:
Cotton
Wool
Vegetable fiber—cotton, flax (summer rugs)
Animal hair—cow (chenille rugs, Chinese rugs), goat (Oriental rugs), dog (Chinese rugs), cat, sheep
Linen, silk

Pads (under Rugs):
Animal hair (especially cattle), cotton linters

Articles of Clothing

Clothing and Dresses:
Cotton, rayon
Wool
Linen
Silk
Animal hair—camel or goat. Latter mixed with silk or wool in men's *summer* suits. Best mohair often used in camel's hair
Dyes

Hat Trimmings:
Feathers

Underwear:
Silk, rayon
Cotton

Thread.
Silk
Linen

Shoes:
Patent leather—linseed oil
Sandals—straw of wheat, rye, barley and rice
Rabbit skin—after hair is removed

Braids and Wigs:
Animal hair—goat and horse, sheep wool
Human hair

Robes and Padding:
Wool—sheep's
Animal hair—horse
Vegetable fiber—cotton, rayon

Hats:
Animal hair—horse, goat, rabbit, wool, lamb, beaver, camel
Cotton, rayon
Straw—wheat, rye, barley and rice
Wool
Silk

Linings (coats, gloves, slippers, etc):
Animal hair—cat, dog, goat, rabbit and sheep

Fur Substitutes:
Animal hair—horse, leopard, lynx, cat, dog, goat, monkey fur, rabbit, coney, white fox (dyed blue or red fox) and cow skins
Sheep wool
Fur skins treated with egg

Hosiery:
Silk, cotton
Rayon, nylon
Sheep wool
Animal hair—goat, rabbit, camel

Neckties:
Silk, rayon
Wool
Cotton
Animal hair—rabbit

Mouth Washes:

Alcohol and water flavored as above—in addition cloves, cinnamon, mace and sage are frequently used.

Soaps:

Made from caustic soda or caustic potash and fats of animal origin or oils of vegetable origin. Most common fats are tallow, horse fat, wool fat, neat's-foot oil, and fish oils. Those of vegetable origin are cocoanut oil, palm oil, cocoa butter, olive oil, sesame oil, peanut oil, castor oil, cottonseed oil, almond oil, linseed oil, sunflower oil, *poppyseed oil, colza oil. Soaps are perfumed with* essential oils. Resin used in certain soaps.

Cold Cream:

Bases most frequently used are almond oil, cocoa butter, lanolin, liquid paraffin, white wax, and spermaceti. Borax usually present. Perfume most frequently used is rose.

Vanishing Creams:

Contain stearic acid, potassium hydroxide, water, alcohol, and perfume.

Lotions or Complexion Beautifiers:

Opalescent lotions usually contain: mercuric chloride, tincture of orris, tincture of benzoin, eau de cologne, and rose water.

Milky lotions contain powdered almonds, powdered soap, glycerin, borax, mercuric chloride and lavender water.

Astringents:

Usually potash, alum, eau de cologne, and flower water.

Shaving Preparations:

1. *Shaving Creams:* potash lye, such fats as lard, tallow, cocoanut oil, olive oil, peanut oil, sesame oil and lanolin and perfumes.
2. *Shaving Lotions:* two types, one type usually contains peppermint oil, glycerin and bay rum. Second type usually contains menthol, tragacanth, benzoin tincture, glycerin, cassia oil, cinnamon leaf oil, geranium and water.
3. *Shaving Powders:* finely powdered soap, maize starch, or orris root, perfume.

Hair Preparations:

1. *Brilliantines:* liquid varieties are usually made of liquid paraffin or castor almond, olive, peanut, and peach kernel oils. Non-oily types contain glycerin. Solid brilliantines consist of white, or paraffin jelly mixed with cerosine or white wax. All are perfumed. Hair lacquers cause allergy.
2. *Pomades:* contain petrolatum, castor oil, lard, palm oil, almond, peach kernel oil, peanut oil, cocoanut oil, lanolin, beeswax, and spermaceti, benzoin, and oils to perfume.
3. *Shampoos:* powder forms contain sodium sesquicarbonate, sodium carbonate, borax, saponine and powdered soap. *Dry shampoos are similarly made* but do not contain soap, and do contain starch, powdered orris root and fuller's earth.

   Liquid forms contain olive or linseed oil, alcohol, lavender oil, rosemary oil, rose geranium oil, potash. Cocoanut oil shampoos contain cocoanut oil.
4. *Depilatories:* contain sulfides usually of calcium strontium, or barium, mixed with starch, talcum or zinc oxide. May also contain linseed oil, castor oil, glycerin, calcium hydroxide, and soft soap and perfume.
5. *Hair Dyes:* contain quarcitron, henna leaves, jaborandi, sage leaves, walnut hulls. Chemicals used are arsenious acid, bismuth, cobalt, lead, mercury, nickel, silver, sulfur compounds; paraphenyldiamine.

5. Milled pyrethrum, as commercially obtainable (water added to make thick paste)
6. Butesin picrate, 5 per cent ointment, as commonly obtainable
7. Quinine hydrochloride, 1 per cent aqueous solution
8. Resorcin, 1 per cent aqueous solution†
9. Paraphenylendiamine, 2 per cent in petrolatum
10. Tuberculin, 1:1000 in physiologic saline†
11. Trichophytin, 1:1000 in physiologic saline†
12. Potassium iodide, 25 per cent in lanolin-petrolatum $\overline{aa}$
13. Formalin, 5 per cent aqueous solution
14. Nickel sulfate, 5 per cent aqueous solution†
15. (a) Bichloride of mercury, 1:1000 aqueous solution,† or
    (b) 5 per cent white ammoniated mercury ointment
16. Tetrabromfluorescein (powder, with water added to make thick paste)
17. Sudan III, 5 per cent, in olive oil
18. Poison ivy, acetone extract (8 to 13 per cent solids, diluted 1:5000 with acetone)
19. Ammonium fluoride, 1 per cent aqueous solution†
20. Benzocaine, 5 per cent in lanolin-petrolatum $\overline{aa}$

SCHEDULE FOR SUBCUTANEOUS HISTAMINE THERAPY‡

Injection	*Dilution*	*Amount cc.*	*Interval*
1	1:10,000	0.05	
2	1:10,000	0.05	Twice a day
3	1:10,000	0.10	
4	1:10,000	0.10	
5	1:10,000	0.15	
6	1:10,000	0.20	
7	1:10,000	0.25	
8	1:10,000	0.30	
9	1:10,000	0.35	
10	1:10,000	0.40	Once a day
11	1:10,000	0.45	
12	1:10,000	0.50	
13	1:1,000	0.05	
14	1:1,000	0.10	
15	1:1,000	0.15	
16	1:1,000	0.20	
17	1:1,000	0.25	Every 2 days
18	1:1,000	0.30	
19	1:1,000	0.30	
20	1:1,000	0.30	
21	1:1,000	0.30	
22	1:1,000	0.30	Every 3 days
23	1:1,000	0.30	
24	1:1,000	0.30	

The dosage [illegible]

* Sulzberger, M., and Rostenberg, A.: Practical Procedures in the Investigation of Certain Allergic Dermatoses, J. Allergy [illegible] published by Sul[illegible]

† These solut[illegible] the preparation. [illegible] solutions must b[illegible]

‡ From "Syn[illegible] by H. L. Alexander.

Living Room

Upholstered Furniture:
Cotton, rayon
Wool
Silk
Linen
Animal hair—mohair (goat)
Castor oil (artificial leather)

Tapestries and Portieres:
Wool
Silk, rayon
Animal hair—mohair

Furniture Polish:
Linseed oil (flaxseed)

Bookbinding:
Cottonseed oil, glue
Castor oil
Dyes

Stuffed Furniture:
Feathers of duck, goose, swan, pigeon, *turkey and chicken*
Cotton
Kapok
Wood shavings
Vegetable fiber—cotton
Straw—wheat, rye, barley and rice, flax
Animal hair—horse, cat, cow, hog, goat, rabbit
Sheep wool

Piano:
Sounding hammer—rabbit hair

Writing Paper:
Cotton linter
Flaxseed

Kitchen

Oilcloth and Artificial Leather:
Cottonseed oil
Linseed oil
Castor oil
Corn oil

Brushes and Brooms (clothes, hair, shoe and tooth):
Straw—wheat, rye, barley and rice
Animal hair—mule, hog, horse, goat, sheep (shoe brush), cow, squirrel, camel

Flypaper:
Castor oil, glue

Glue:
Fish glue—fish
Animal glue—horse, cow, sheep, hog, rabbit, dog, cat

Linoleum:
Cottonseed oil
Linseed oil
Castor oil

Chair Seats:
Straw—wheat, rye, barley and rice

Laundry:
Laundry starch—corn, wheat, rice
Soaps—*cottonseed oil, corn oil*, wool grease, castor oil
Candles—cottonseed oil

Twine and Rope:
Animal hair—horse, goat, *camel, cow,* rabbit
Cotton linter
Straw—rye, wheat
Flaxseed *yarn*

Building and Roofing Supplies

Insulation:
Animal hair—rabbit, cow, dog, goat
Straw—flax

Roofing Tar:
Cottonseed oil
Linseed oil
Castor oil

Paints and Varnishes:
Linseed oil
Corn oil

Plaster:
Animal hair—horse, goat, cow and *hog*

STANDARD LIST OF CONTACTANTS*

1. Whitfield's ointment (N.F.), petrolatum āā
2. Turpentine, 50 per cent, in olive oil
3. Sodium arsenate, 1 per cent aqueous solution†
4. Neoarsphenamine, 1:500 aqueous solution†

direct heat, stirring constantly. Remove from the fire. Do not overcook. Stir occasionally as it cools.

(3) *Lamb Patties*

Ground lamb pressed into small patties. Broiled or fried.

(4) *Soy-potato Muffins or Bread*

1 cup soy flour*	2 Tbsp baking powder
1 cup potato starch flour	1 Tbsp. white sugar
1 tsp. salt	1 Tbsp. brown sugar
½ cup soy oil	¾ to 1 cup water

Sift the soy flour once before measuring. Fill the measuring cup lightly and level off the surface with a knife blade. Sift all the dry ingredients together four times. Add the oil and water and beat well. Pour the batter into muffin pans which are well greased with soy oil. Bake in a moderate oven (350° to 375° F.) for 25 to 30 minutes. Makes 12 muffins.

For bread, bake in a loaf pan at 350° F. for 1½ hours

If a moister texture is desired, decrease the potato starch flour to ¾ cup.

(4-a) *Soy-Corn or Soy-Rice Muffins*

Cornmeal, cornstarch or rice flour may be substituted for potato starch flour if the latter is not available during the war, or if corn or rice products are included in the diet.

Muffins made with soy flour and corn meal are better if baked at 400° F. The amount of water required varies somewhat with combinations of soy flour and corn starch, corn meal, potato starch or rice flour, but the mixture should be similar to cake batter in consistency. *The texture can be changed* with proportions of soy flour and starch—for a drier texture, increase the starch or if more moisture is desired decrease the starch to ¾ cup. Bacon fat or Mazola oil if corn is used may be substituted for soy oil

(5) *Soy-Lima-Potato Muffins or Bread*

1 cup potato starch flour	2 Tbsp. sugar
¾ cup soy bean flour*	1 cup water†
¼ cup lima bean flour	6 tsp. baking powder
¼ cup sesame or soy oil	½ tsp. salt

Sift flour, baking powder and salt together three times. Blend the oil and sugar well. Add the sifted flour and the water alternately to the oil and sugar. Beat well and pour into muffin pans which have been well greased with sesame or soy oil. Bake at 375° F. for 25 to 30 minutes. Makes 12 muffins. Or bake in a loaf pan at 350° to 375° F for 1½ hours.

(6) *Soy-Potato Pancakes or Waffles*

To the recipe for muffins (4) add about ½ cup of extra water to make a thinner batter. Bake on a griddle or waffle iron well greased with soy oil. Serve with maple syrup or syrup made with brown and white sugar flavored with maple or caramel.

* A full fat processed soy bean flour is advised [illegible]
made by Archer-[illegible]
[illegible] water after

RECIPES

The following recipes have been devised especially for the elimination diets. Satisfactory products have resulted with their use in many homes and diet kitchens.

During the war, the physician may have to order extra amounts of rationed foods such as meat, oils, canned vegetables and fruits. Moreover if certain foods such as tapioca, potato starch flour and sesame oil become scarce or unobtainable substitutes will be necessary. These temporary changes in the elimination diets are discussed on page 152 and also in the comments on the menus.

Recipes for muffins, bread, cake and cookies have been *revised* according to experience. To assure more uniform results, processed full fat soy bean flours such as Staley's Soy Flour No. 1 (A. E. Staley Co., Decatur, Ill.), or Orangeblossom Soy Flour (Archer-Daniels-Midland Co., Minneapolis, Minn.) are advised. A flour made from the raw whole bean also may be used but it is more bitter and molds more easily than the processed flour. Recommended measured amounts of the ingredients and the time and temperature for baking must be followed.

Measuring cups and spoons must be filled lightly and leveled off with a knife blade. Flours must not be packed or shaken into the cups.

Table of Abbreviations and Measurements

Tbsp.	=	tablespoonful	16 Tbsp.	=	1 cup
tsp.	=	teaspoonful	8 Tbsp.	=	½ cup
cup	=	cupful	8 oz.	=	1 cup
			3 tsp.	=	1 Tbsp.

Important Recipes for the Cereal-free Elimination Diets

(1) *Fruit Tapioca*

2¼ cups canned fruit juice and water
4 Tbsp. Minute tapioca
½ cup sugar
¼ tsp. salt
1 to 1½ cups chopped or puréed apricots, pears, prunes or pineapple
1 Tbsp lemon juice

Combine fruit juice and water, Minute tapioca, sugar and salt in a sauce pan and mix well. Bring mixture to a boil, stirring constantly. Remove from fire. Do not overcook. Cool, stirring occasionally. Mixture thickens as it cools.

(2) *Fruit-free Tapioca*

3 cups water
⅓ cup Minute tapioca
¾ cup white sugar, or
¾ cup brown sugar
¼ tsp. salt
⅓ tsp. maple flavoring or 1 tsp. vanilla extract, or
2 tsp. caramel flavoring

(The amount of brown sugar and flavoring may be varied to suit the individual taste.)

Combine all ingredients in a saucepan. Bring mixture quickly to a full boil over

prinkle lightly with salt. These crackers will remain crisp if kept in a tightly overed container.

(8-e) *Soy Cookies**

- 1 cup soy flour
- 2 tsp. baking powder
- ¼ tsp. salt
- ½ cup sugar
- 4 Tbsp. soy oil
- 3 to 5 Tbsp. water
- ½ tsp. vanilla or lemon extract

[illegible]

(8-f) *Soy-Potato Pudding*

- 4 level Tbsp. soy flour
- 1 cup water
- 2 tsp. potato starch flour
- 3 Tbsp. sugar
- ⅛ tsp. salt
- ½ tsp. lemon extract
- ½ tsp. vanilla extract

Cook the soy flour and water for 15 minutes in top of double boiler.† Stir potato starch, sugar and salt [illegible] 20 minutes. Flavor [illegible] May serve with fruit [illegible] be desired or a combination of white and brown sugar may be used.

(Note.—[illegible] may be use [illegible] available, 1 [illegible] *For fruit-fr*[illegible] necessary. [illegible] also must be omitted.)

(8-g) *Caramel Frosting*

- ¾ cup water
- 2 cups brown sugar
- 3 Tbsp. soy oil
- 1 tsp. vanilla extract

Combine sugar and water. Stir slowly while bringing it to a boil Boil hard, stirring occasionally until the syrup has reached the "soft ball" stage (234° F.). Remove from the fire, add soy oil and vanilla and allow to cool undisturbed until lukewarm. Beat the mixture until it gets thick and loses its luster. Spread quickly over the cake.

(8-h) *Pineapple Filling*

- 2 Tbsp. potato starch flour
- ½ cup sugar
- 2 cups crushed pineapple—juice and fruit
- 1 Tbsp. lemon juice

Mix flour and sugar, add pineapple and lemon juice and cook slowly until thick and clear. Cool slightly before spreading on cake. This may be used on top of the cake as well as for the filling Apricots or peaches may be substituted for pineapple.

* These soy crackers and cookies are less desirable than those made with potato starch. If potato starch is not available and if possible allergy to rice and corn exists, pure soy products may be necessary for diet trial. They are also of value when high protein diets are desired.

† ½ cup of Kreme O'Soy milk (see page 179) and ½ cup of water may be substituted for the soy flour and water if desired

(7) *Lima Bean or Split Pea Soup*

1 cup split peas or lima beans	1 qt. water
2 Tbsp. bacon fat	Salt
Diced bacon, crisp	

Cook the split peas or lima beans and salt until it forms a smooth purée. Before serving, add the bacon fat and crisp fried bacon.

(7–a) *Tomato Soup (With Soy Bean Flour)*

1 cup strained tomatoes, or juice	2 Tbsp. soy bean flour
1 cup water	1 tsp. salt

Mix the soy bean flour thoroughly with some of the water and add to the hot tomato juice and water. Boil for ½ hour. This resembles a cream soup in consistency and flavor.

(8–a) *Soy-Potato Cup Cakes or Cake*

1 cup soy flour	¼ tsp salt
¾ cup potato starch flour	½ cup soy oil
5 tsp. baking powder	2 tsp. vanilla or 1 tsp. vanilla and 1 tsp. lemon extract
¾ cup sugar or ¼ cup brown and ½ cup white sugar	½ to ¾ cup water

Sift soy flour once before measuring. Sift together all the dry ingredients four times. Mix the oil, sugar and flavoring and to this add the flour and water alternately, beginning and ending with flour. Beat well. Pour into muffin or layer cake pans well greased with soy oil and bake at 375° F. for 30 minutes. Makes 12 cup cakes or 2 small layers Or bake in a loaf pan for 45 to 50 minutes.

Variations: Flavor with lemon extract and grated lemon rind or with maple flavoring. Add chopped apricots, prunes or pineapple Substitute fruit juice for water. May use fondant slightly thinned with water or fruit juice for frosting.

For fruit-free diets, eliminate lemon extract and all fruit and use vanilla extract or maple or caramel flavors

(8–b) *Soy-Potato Cookies*

Follow the r[illegible] Force through [illegible] thinner batter [illegible] at 375° to 400° F. for 10 or 15 minutes. A thicker dough can be forced and kept in a refrigerator. Cut into thin slices and bake as desired. If kept in an air-tight container, cookies will remain crisp.

(8–c) *Soy-Corn or Soy-Rice Cup Cakes, Cake and Cookies*

If potato starch is not obtainable, cornstarch or rice flour can be substituted in the soy-potato cake and cookie recipes. The amount of water required varies somewhat with kind of starch used. The texture should be that of cake batter The texture will be drier if the starch is increased to 1 cup.

If cornstarch is used, Mazola oil can be substituted for soy oil and confectioners' or powdered sugar containing 3 per cent cornstarch can be used for frosting.

(8–d) *Soy Cracker**

1 cup soy flour	2 Tbsp. soy oil
1 tsp. baking powder	1 tsp. sugar
¼ tsp. salt	½ cup water

Mix all ingredients well. Dough should be quite thin. Drop from a teaspoon onto a cookie sheet well greased with soy oil. Bake at 350° F. until dry and crisp.

Important Recipes for Elimination Diets 1 and 2

Corn Pone

(10)

- 1 cup cornmeal
- ½ tsp salt
- Boiling water
- 1 Tbsp. Mazola oil

[illegible]

Corn-Rice Muffins

(11)

- 1½ cups cornmeal
- ¾ cup rice flour
- ¼ cup sugar
- ½ tsp. salt
- 2½ tsp. baking powder
- 1 cup water
- 3 Tbsp. Mazola oil

Sift all the dry ingredients together, add the water and oil. Pour into well-greased muffin pans Bake at 400° F. for 30 minutes.

Corn-Rye Muffins

(12)

Use the above recipe but substitute rye flour for rice flour.

Rice Biscuit

(13)

Made by the Battle Creek Sanitarium.

Rice Bread

(14)

- 1 cup rice flour
- 3 tsp baking powder
- 2 Tbsp bacon fat or oil
- 1 Tbsp. sugar
- ½ tsp. salt
- ¾ cup water

Sift the dry ingredients. Add water and fat. Bake in a loaf pan in a moderate oven, 350° to 375° F., for 45 to 50 minutes.

Rye Bread

(15)

- 1½ cups rye flour
- 3 tsp baking powder
- ½ tsp salt
- 3 Tbsp. specified oil
- ¾ cup water (more if necessary)

Sift dry ingredients, add the oil and blend with pastry mixer. Add water and stir until smooth Put in tin and allow to stand for 15 minutes. Bake 45 minutes in moderate oven (350° F).

Corn-Rice Pancakes

(16–a)

- ¾ cup rice flour
- ¼ cup white cornmeal
- 2 tsp. baking powder
- 2 Tbsp. brown sugar
- Salt
- 2 Tbsp. sesame or Mazola oil
- Water to make right consistency
- 1 tsp. caramel

Mix thoroughly and cook on a well-greased griddle.

Pancakes or Waffles

(16–b)

- 1½ cups rice flour
- ½ cup cornstarch
- 1 Tbsp sugar
- ½ tsp. salt
- 3 tsp. baking powder
- 1½ cup water
- 4 Tbsp specified oil

Sift dry ingredients, add water and oil, beat well with a rotary beater. Bake on a well-oiled griddle.

(8–i) *Broiled Frosting*

4 Tbsp. soy oil
¾ cup brown sugar
½ cup water
½ tsp. vanilla
¾ cup finely chopped dried prunes, or candied pineapple

Thoroughly combine all the ingredients and spread over warm cake. Brown lightly under the broiler.

(9–a) *Fondant*

2 cups sugar
¼ tsp. cream of tartar
1 cup boiling water
¼ tsp. salt
½ tsp. vanilla

Measure sugar and cream of tartar into a sauce pan and add the boiling water. Stir over a low heat until sugar is dissolved Do not let the candy boil until the sugar is dissolved and the sugar crystals wiped down from the sides of the pan with a clean cloth. When the boiling point is reached, cover the kettle and boil vigorously for 5 minutes. Remove the cover, wipe off crystals from sides of the pan and continue cooking without stirring until the medium ball stage has been reached (240° to 242° F.). When done, pour the candy at once into a cold wet platter and let it stand until lukewarm. Sprinkle salt over the surface, add vanilla and beat until white and knead in the hands until smooth and creamy. Put fondant into a glass jar and cover. It will keep several weeks in a cool place

Use of Fondant: Put a portion of the fondant into the top part of a double boiler. Melt over hot but not boiling water until fondant softens. Coloring or flavoring is added at this stage. Lemon extract or lemon juice and grated lemon rind, unsalted Se-So Nuts (soaked soy beans browned in sesame oil), chopped prunes or glaced pineapple may be used. Drop fondant from tip of a spoon onto waxed paper.

(9–b) *Panocha*

2 Tbsp. sesame or soy oil
2 cups brown sugar
1 cup white sugar
1 cup water
¼ tsp. soda

Heat the oil in a kettle, stir in sugars. Add water and soda and mix well with sugar. Wipe down sugar from sides of pan. Heat slowly to boiling, stirring until sugar is dissolved. Boil to 240° F., the medium ball stage (the ball holds its shape when lifted from cold water). Remove from stove, sprinkle a dash of salt over top and set aside to cool undisturbed until lukewarm Beat until creamy. Turn into greased pans and cut in squares

(9–c) *Marshmallows*

2 cups sugar
¾ cup water
2 Tbsp. gelatin
⅛ tsp. salt
1 tsp. vanilla extract

Mix sugar and water and boil until the soft ball stage has been reached (234° to 238° F.). Remove from the fire. Soften the gelatin in ½ cup of cold water. Pour the hot syrup over the softened gelatin and stir until dissolved. Let it partially cool, add vanilla and salt and beat it until the mixture is thick and white and will hold its shape. Pour into straight sided pans. When firm, cut into squares. Roll in sugar, or if corn is allowed, powdered sugar may be used.

Rye Coffee Cake

(20)

2 cups rye flour
1 Tbsp. specified oil
1 Tbsp baking powder
4 tsp baking soda
½ tsp. salt
¼ cup water
¼ cup apricot marmalade
3 Tbsp. sugar

Sift all dry ingredients three or four times. Combine marmalade with water. Mix all well and bake in a medium oven.

Puffed Rice Candy

(21)

1 cup sugar
½ cup brown sugar
1 cup water
½ tsp. salt
1 tsp. vanilla
6 cups puffed rice

Cook sugar and water until brittle (254° F.). Add vanilla and salt. Pour over the puffed rice, stirring all the time so that the kernels will be evenly coated. Turn it into a greased pan and cut into squares. Keeps well in an air-tight container.

Miscellaneous Recipes

Pineapple-Apricot Marmalade

(22-a)

4 cups apricot pulp—fruit cut in small pieces and packed solidly in the cup
1 cup crushed pineapple—juice and pulp
3½ cups sugar

Mix fruit and sugar and boil rapidly until thick—approximately 30 minutes. Seal in hot, sterile glasses.

Cotlemade

(22-b)

1 quart apricots
1 quart lemons
Sugar
Water

Slice lemons, rind and all, very thin, discarding the seeds. Barely cover with water and cook gently 1 hour Add the apricots, halved and pitted, and cook another hour, stirring occasionally Measure the fruit and add and equal quantity of sugar Boil rapidly, stirring frequently until the jelly stage is reached. Seal in sterile glasses. This marmalade is rather tart

Grapefruit Marmalade

(23-a)

3 large grapefruit
Sugar
Water

Cut the fruit very fine Measure and cover with 2½ times as much water Let it stand overnight and the next morning boil briskly for 20 minutes. Remove from the fire and measure, adding 1 cup of sugar to each cup of fruit. Stir well until sugar is dissolved and let stand several hours. Boil briskly until it jells. Pour into hot sterile glasses and seal

Lemon Marmalade

(23-b)

Six lemons, unpeeled Slice very thin and cut crosswise into small pieces. Measure fruit. Add three times as much water. Boil about 1 hour or until tender. Replace liquid boiled away with water Allow ¾ cup sugar to each cup of fruit juice Cook in 2-cup lots to the jelly test (thick, reluctant drops from the spoon—about 10 minutes) Pour into sterilized jelly glasses Cover with paraffin. This makes eight 6-ounce glasses

(17) *Corn Crisps*

1 cup cornmeal
1 tsp. salt
2 cups boiling water
1 Tbsp. Mazola oil
1 tsp. sugar

Mix all together. Pour a very thin layer on a well-greased cookie sheet. Bake 15 minutes at 350° F. While warm, cut into strips and sprinkle with salt.

(18-a) *Rice Fruit Pudding*

1⅓ cups cooked rice
¼ cup sugar
½ tsp. salt
1 cup canned apricots, peaches, pineapple, or prunes and juice

Mix all ingredients together and bake in a moderate oven for 30 minutes. Serve warm with a pudding sauce.

(18-b) *Rice Pudding With Lemon*

1⅓ cups cooked rice
¼ cup sugar
½ tsp. salt
1 Tbsp. lemon juice
2 tsp. grated lemon rind
Lemon sauce

Mix all ingredients together. Serve with additional lemon sauce.

(19-a) *Rice Cup Cakes*

¾ cup hot water
1½ cups rice flour
2 level Tbsp. of prescribed oil
¼ cup sugar
½ tsp. salt
3 level tsp baking powder
1 tsp. vanilla

Pour hot water over half the flour. Cream sugar and oil and add to the above mixture, beating well. Add the other ingredients, mixing well Bake in muffin pans about 20 minutes in a fairly hot oven (400° F.).

(19-b) *Rice Cookies*

3 cups rice flour
2 tsp. baking powder
1 cup sugar
½ cup of prescribed oil
1 lemon rind, grated
1 lemon—juice
¼ cup water

Sift dry ingredients, cream thoroughly with shortening. Add grated lemon rind and juice with just enough water to make a stiff dough and pat into shape. Sprinkle with sugar and bake in moderate oven for 5 to 7 minutes.

(19-c) *Lemon Frosting*

1 Tbsp. grated lemon rind
Dash of salt
2 Tbsp. sesame or soy oil
3 cups confectioner's sugar
2 Tbsp. lemon juice
1 Tbsp. water

Mix oil, salt, and lemon rind. Add fruit juice and water alternately with sugar, stirring well after each addition. Place bowl over hot water a few minutes. Remove and spread over cake. This will cover a two-layer cake or 24 cup cakes.

(23–c) *Carrot Marmalade*

5 large carrots
4 lemons

Sugar
Water

Squeeze the lemons, removing the seeds and set the juice aside. Grind lemons and carrots together. Add 8 cups of water to the pulp and boil for 30 or 45 minutes. Measure this mixture and to it add an equal quantity of sugar and the lemon juice. Boil briskly for an hour or until it jells. Pour into sterile hot glasses and seal with paraffin.

(24) *Tomato Preserves*

Select firm, ripe tomatoes. Remove the skins, cut in slices and drain an hour or more. For each cup of tomatoes add a cup of sugar and boil until thick, stirring often. Sliced lemon may be added to the tomatoes while cooking.

(24–a) *Pear Marmalade*

Peel fresh pears; slice and cover with sugar, using $\frac{3}{4}$ pound of sugar to 1 pound of fruit. Let stand until a syrup forms—boil slowly until thick. When fruit is partly cooked, add one-half can of grated pineapple for each 4 pounds of pears used in the recipe. Then seal in sterilized jars.

(24–b) *Pear Butter*

Peel and core 1 gallon of fresh pears; put in kettle and add 2 cups water; boil slowly; when done put through a colander. To every 4 cups of pulp add 2 cups of sugar. Place on stove again and cook slowly until dark and very thick. Stir occasionally. A few minutes before removing, add juice of 1 lemon. Sterilize jars, rubbers and lids, fill and seal while hot

(25–a) *Salad Suggestions*

(*a*) Tomatoes stuffed with tiny green lima beans which have been marinated in French dressing.
(*b*) Sliced marinated beets mixed with cold sliced tongue, shredded lettuce and French dressing.
(*c*) Cold artichoke served with oil, salt and lemon juice
(*d*) Cut lemon or lime gelatin into $\frac{1}{4}$ inch cubes and serve with fruit salads or fruit cocktails.

(25–b) *Molded Pear Salad*

Dissolve a package of lemon gelatin in 2 cups of warm water. Pour one-half into a pan and let stand Fill cavity in each pear half with crushed pineapple, set upon chilled layer of gelatin and cover with remaining gelatin. Let set. Serve on lettuce with French dressing.

(26) *Broiled Grapefruit*

Cut grapefruit in halves, remove the center, and cut around each section. Sprinkle a teaspoonful of brown sugar over each half. Place under the broiler and broil for 10 to 12 minutes. Serve hot.

Sliced pineapple, apricots, peaches or prunes prepared in a similar way are attractive and delicious additions to broiled lamb chops, steak or chicken.

(27) *Baked Pears*

6 medium sized pears
½ cup water
1 cup sugar, white or brown

Wash the pears and remove the blossom ends. Place in a baking dish, add sugar and water, cover and bake at 350° F. for 1 hour, or until pears are tender. Peaches may be baked in the same way, in which case select firm fruit and peel before baking.

(28–a) *Lemon Ice*
(Made in the Refrigerator)

¾ cup sugar
2 cups water
1½ tsp. plain unflavored gelatin soaked in 3 Tbsp. water
Pinch of salt
⅓ cup lemon juice
1 tsp. grated lemon rind

Cook sugar and water together 3 minutes. Dissolve soaked gelatin in the hot syrup. Add salt and lemon juice. Turn into the refrigerator tray and freeze until solid 1 inch from edge of tray. Scrape from the sides of the tray and transfer to a chilled bowl. Beat with a chilled rotary beater until fluffy and smooth. Return to tray and freeze again until firm.

(28–b) *Apricot Ice*

⅔ cup sugar
½ cup water
Pinch of salt
1½ tsp. gelatin soaked in 3 Tbsp. water
1½ cups apricot nectar or puréed apricots and juice
2 Tbsp. lemon juice
1 tsp. grated lemon rind, if desired

Follow directions above for Lemon Ice.

(28–c) *Pineapple Ice*

Substitute 1½ cups of canned, crushed, undrained pineapple in the recipe for Apricot Ice.

(28–d) *Lemon Ice*
(Using a mechanical freezer)

1 cup sugar
3 cups water
¼ tsp. grated lemon rind
⅓ cup lemon juice

Boil sugar and water for 5 minutes. Remove from stove and cool. Add lemon juice and rind. Pour into the freezer can and freeze, using 6 or 8 parts of ice to 1 part of rock salt This makes a little over 1 quart

(28–e) *Pineapple or Apricot Ice*

1 cup sugar
3 cups water
1 Tbsp. lemon juice
2 cups canned, crushed pineapple or apricot purée
¼ tsp. salt

Follow directions above for Lemon Ice using a mechanical freezer.

NOTE.—Maple flavoring or caramel may be substituted if fruit is not allowed in the diet.

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(28-f) *Frappés*

Frappés are water ices frozen to mush consistency and may have large crystals through them. Tomato juice, various combinations of fruit juice, or puréed fruits and juice can be used. They may be served as a dessert or beverage.

(29-a) *Candied Fruit Peel*

Remove the peel from lemons or grapefruit in lengthwise slices. Place in a sauce pan, cover with cold water, add ¼ tsp. salt, heat slowly to boiling and boil gently until the peel is soft. Drain off the water. When peel is cool enough to handle, remove all the white fibrous portions, using a spoon to scrape it out. Cut rind in thin strips with sharp scissors.

(29-b) *Glacé Fruit*

2 cups sugar
¾ cup water
¼ tsp. cream of tartar

Heat sugar and water slowly to boiling and add cream of tartar. After boiling point is reached, do not stir and keep the crystals wiped down from the sides of the pan. Boil to 300° F., or until syrup just starts to discolor. Remove pan at once from the heat, plunge it into a pan of cold water to stop the boiling, and then set the kettle in a pan of hot water.

The dipping should be done quickly. Have small pieces of well-drained pineapple, grapefruit sections, pitted prunes, or thin slices of lemon ready, each one fastened on a skewer or toothpick. Dip each piece into the syrup. When well covered, remove and place and allow to cool on a platter well greased with an oil allowed in the diet. After cooling the skewer is removed.

(30) *Lamb or Chicken Croquettes*

1½ cups cooked chicken, chopped fine
½ tsp. salt
1 cup chicken broth (made at home)
3 Tbsp. quick-cooking tapioca or 2 Tbsp. cornstarch or tapioca flour

Cook the tapioca in the chicken broth for 6 minutes or until the tapioca is clear. Add the chicken and salt. Chill and shape into croquettes. Roll in crushed cornflakes, rice flakes, or crumbs of soy bean bread. Fry in deep prescribed oil or bake in the oven for 30 to 45 minutes.

(31) *Corn Starch Fruit Blanc Mange*

1½ cups fruit pulp and juice
1½ cups water
4 Tbsp. cornstarch
3 Tbsp. sugar

Dissolve cornstarch in a little water. Heat the fruit pulp, water and sugar. When almost boiling add the cornstarch mixed in water. Continue cooking for 15 or 20 minutes in a double boiler. Pour into molds and chill. Serve with fruit or pudding sauce.

(32) *Clear Pudding Sauce*

½ cup sugar
1 Tbsp. cornstarch, tapioca flour or tapioca
¼ tsp. salt
1 cup boiling water
1 tsp. vanilla or lemon extract

Measure sugar, cornstarch (or tapioca flour) and salt into a sauce pan. Mix well. Add boiling water slowly, stirring carefully to make a smooth sauce. Heat to boiling, stirring constantly until thickened, smooth and clear. Add vanilla or lemon extract and serve hot.

(32-a) *Lemon Sauce*

3 Tbsp. lemon juice or a small amount of grated lemon rind added to the above recipe. Add juice and rind last.

(32-b) *Maple or Caramel Sauce*

Use ½ tsp. maple flavoring or 1 tsp. caramel instead of vanilla or lemon.

(32-c) *Jellied Prunes and Pineapple*

2 Tbsp gelatin	2 Tbsp. lemon juice
¼ cup cold water	½ lb. prunes—cooked
¾ cup boiling water	1 cup diced pineapple
½ cup sugar	

Remove stones from cooked prunes and cut in quarters. Mix fruit, lemon juice and sugar. Soak the gelatin in cold water 10 minutes and dissolve in boiling water. Add to the fruit mixture. Pour into molds and chill.

(33) *Vegetable Chowder*

2 cups diced potatoes	2 cups stewed or canned tomatoes
1 cup diced carrots	2 cups of water or beef stock
1 cup lima beans, peas, string beans —mixed	Salt to taste
	¼ pound bacon diced and fried crisp

Cover the vegetables with water or stock and cook until tender. Dice the bacon and fry until crisp Add to the chowder just before serving.

(34) Use Minute tapioca or potato starch as a binder in a meat loaf or to thicken stew or meat pie.

(35-a) *Tomato Preserves—Fruit-free*

2 cups well-drained tomatoes—fresh or canned	1 cup sugar
	2 Tbsp. white vinegar

Boil until mixture thickens.

(35-b) *Carrot Preserves*

2 cups shredded carrots	1 cup sugar
1 cup water	2 Tbsp. white vinegar

Boil all ingredients until carrots are tender and mixture thickens.

ADDITIONAL RECIPES*

Soups

Beef Broth (With Soy Bean Flour)

2 cups beef stock	Salt to taste
4 Tbsp soy bean flour	Vegetables

Mix the soy bean flour with part of the stock and add to the hot soup. Boil for 30 minutes Diced carrots, lima beans, peas or potatoes may be added as desired.

* Recipes for wheat-free, egg-free and milk-free bakery products are not included because of space. They can be readily improvised by modification of the various recipes in this volume or may be found in the larger texts on the subject.

Scotch Broth

2 lbs. shoulder of lamb
2 quarts water
¼ cup pearl tapioca
½ cup diced carrots
Salt

Cut the meat into small pieces and boil until tender. Cool and strain. Separate the lean meat from the bones and return it to the broth, together with the tapioca and carrots. Simmer gently until tapioca is clear.

Hamburg-Vegetable Chowder

¾–1 lb. ground beef
3 Tbsp. specified oil
2 cups canned tomatoes
2 carrots—diced
2 cups cubed potatoes
¼ cup pearl tapioca
2 tsp. salt
1½ quarts water

Brown the meat in the fat; put all the ingredients in a kettle and simmer slowly for an hour.

Borscht—Russian Beet Soup

1 bunch beets
1 cup strained tomatoes—fresh or canned
1 quart water
½ lb. breast of beef—cut in small pieces
1 Tbsp. lemon juice
¼ cup sugar
¼ tsp. salt

Pare the beets and cut them into long strips. Add the tomatoes, water, and meat. Simmer for 30 minutes before adding lemon juice, sugar and salt. Boil for ½ hour longer. Serve very hot.

Salads

Lamb and Vegetable Salad

2 cups diced cooked lamb
½ cup cooked peas
1 cup chopped lettuce
Special French dressing (page 245)

Mix all together and let it stand ½ hour before serving.

Wilted Lettuce

4 slices bacon—diced
¼ cup white vinegar
1 Tbsp. sugar
1 tsp. salt

Fry the bacon until crisp; add the remaining ingredients. Heat and pour over a bed of chopped lettuce. Mix well and serve immediately. Or place shredded lettuce in the frying pan and toss until wilted.

Tomato Jelly Ring

1 Tbsp. gelatin
½ cup tomato juice—cold
1 cup tomato juice—hot
½ tsp. salt
1 tsp. sugar
1 Tbsp. white vinegar or lemon juice

Soften gelatin in ½ cup cold tomato juice. Add the hot tomato juice, salt, sugar and vinegar and stir until dissolved. Pour into a ring mold. When firm unmold on a bed of lettuce and fill the center with mixed vegetables which have been marinated in French dressing made with white vinegar and specified oil. Use only the vegetables allowed in the diet.

Cooked Spinach Salad

Pick over, wash and cook the spinach or chard. Do not overcook. Drain and chop. Season with salt and lemon juice. Oil small ring molds with sesame or soy oil and pack solidly with the spinach or chard. Chill, remove from molds and serve with French dressing made with white vinegar or lemon juice and specified oil.

Raw Spinach Salad

Wash the spinach or chard well. Use the small leaves whole, cut the larger ones in pieces. Add ¼ cup French dressing made with specified oil and white vinegar for 4 cups raw spinach. Let it stand 20 minutes before serving. Tender raw spinach or chard may be served in a mixed vegetable salad or instead of lettuce as a garnish.

Stuffed Tomato Salad

Peel medium sized tomatoes, scoop out the center, sprinkle with salt and let them stand upside down until well chilled Fill the centers with any of the following:

1. Short asparagus tips held with rings of cold sliced beets.
2. Diced cooked carrots and small lima beans.
3. Pineapple tidbits and tomato centers.
4. Pineapple tidbits and grated raw carrots.
5. Diced cold chicken, shredded lettuce and pineapple.

Salad Bowl

2 tomatoes
1 small head lettuce
1 cup tender raw spinach
1 cup cooked peas
1 cup cooked slivered tongue
Special French dressing (page 245)

Mix all together in a salad bowl. Chill thoroughly before serving.

Salad Dressing

Peach Dressing

2 cups canned peach juice
⅓ cup sugar
¾ cup sieved peaches
2 Tbsp. specified oil
1 Tbsp. lemon juice

Cook all together for 5 minutes. Chill and serve with fruit salads.

French Dressing

⅔ cup specified oil
⅓ cup lemon juice or white vinegar or half of each
½ tsp. salt
1 tsp. sugar

Mix well before using on salads. Tomato juice may be added for vegetable salads or pineapple juice for fruit salads.

Sweet Clear Dressing

¾ cup white sugar
¼ cup white vinegar
½ tsp. salt
1 cup specified oil

Bring the sugar, salt and vinegar to boiling point. Cool and add oil slowly, beating constantly with a rotary beater.

Meats

Lamb en Brochette

1½ lbs. lamb shoulder
3 thick slices bacon
3 slices pineapple—drained

Cut lamb in 1 inch cubes, bacon in 1 inch squares and pineapple in wedges. Place 1 piece of each on wooden skewers, repeating until skewers are filled. Broil under moderate heat until browned on all sides or roast in the oven for 1 hour.

Casserole of Chicken

2 cups cooked chicken
1½ cups chicken stock
2½ Tbsp. tapioca
½ tsp. salt

Place all ingredients in a casserole greased with chicken fat and bake in a hot oven (400° F.) for 30 minutes, stirring 3 times during the first 15 minutes.

Porcupine Beef Balls

½ cup uncooked rice
1½ lbs. ground beef
1 tsp. salt
2 cups tomato purée

Wash the rice and drain well. Mix with the ground beef and shape into balls. Pour the tomato purée over the meat balls, cover the dish and bake in a slow oven, 350° F. for 1½ hours until the rice is cooked. Remove the cover during the last 30 minutes of baking.

Casserole of Rice and Liver

2 cups cooked rice
2 Tbsp. specified oil or bacon fat
1 lb. lamb or calves' liver
2 cups water or stock
2 Tbsp. rice flour
Salt

Line a well-greased casserole with the cooked rice. Cook the liver until tender and cut in small pieces. Make a sauce from the water used to cook the liver (add sufficient water or stock to make 2 cupfuls) and flour. Heat until thick, add the chopped liver and pour over the cooked rice in the casserole. Bake for ½ hour.

Bacon Grill

1 lb. sliced bacon
6 slices pineapple
Asparagus bundles
3 large cooked potatoes
2 Tbsp. bacon fat or specified oil

Arrange sliced bacon, pineapple, asparagus bundles and cooked potato halves on the broiler rack. Dot asparagus and potatoes with oil or fat. Broil at moderate temperature until bacon is done and fruits and vegetables heated through and browned. Turn bacon to insure even cooking. To serve, arrange fruits and vegetables in center and bacon as a border.

Lamb Tongues

Scrub tongues well. Cover with hot water and cook slowly for 1½ to 2 hours. Season with salt when half cooked. When tongues are done, remove from liquor and skin.

Lamb Stew

Brown pieces of stew meat slowly in bacon fat. As each piece browns remove to stew pan and pour hot water into the drippings in the skillet. Simmer for a few minutes and then pour over meat in pan, using enough water to cover well. Cook slowly until tender. Add salt, potatoes, carrots, and string beans as desired. When vegetables are cooked thicken gravy with potato starch flour.

Spanish Meat Balls

Form ground lamb which has been seasoned with salt into balls. (One pound of meat will make 6 average sized balls.) Brown in bacon fat in skillet and pour canned tomatoes over the balls and simmer for a few minutes. Season the tomatoes with salt. Place in moderate oven and cook for ¾ hour.

Tomato Sauce

2 Cups strained tomato cooked down to 1 cup with the juice of 1 lemon, salt and sugar to taste.

Vegetables

Dried Soy Beans

Dried soy beans can be prepared in the same manner as dried beans Cover 1 cup of soy beans with 1 quart of water and let them stand overnight. In the morning add 1 cup or more of water and boil until tender—about 3 hours. The soy beans can be served boiled or baked with brown sugar, bacon and tomato puree, or prepared as a plain puree salted to taste.

Lima Bean Casserole

1 cup dried lima beans
1 tsp. salt
2 Tbsp. brown sugar
2 cups tomatoes
3 slices bacon

Soak the lima beans overnight in 1 quart of water. Cook in the same water for 30 minutes. Drain Mix lima beans with the other ingredients in a casserole and bake at 250° F. until tender—about 2 hours.

Baked Stuffed Sweet Potatoes

Bake large sweet potatoes. When cooked cut a slice from the top, scoop out the mealy portion. Mash and moisten with 1 or 2 Tbsp. of grated pineapple for each potato, 1 tsp. soy or sesame oil and salt to taste. Fill the potato cases and reheat.

Glazed Carrots

6 whole cooked carrots
2 Tbsp. sesame or soy oil
2 Tbsp. sugar
¼ cup water

Make a syrup of the sugar and water. Cook carrots in the syrup, turning often to prevent burning.

Succotash

Combine equal parts of whole kernel corn, fresh or canned, and green beans, lima beans or cooked soy beans.

Harvard Beets

2 cups cooked beets
1 Tbsp. sesame or soy oil
¾ tsp. potato starch or tapioca flour
¼ cup sugar
¼ cup white vinegar
¼ tsp. salt

Make a sauce of the vinegar, potato flour, sugar and salt and add the beets.

Bread and Cake

Quick Sweet Rolls

2 cups flour, half soy bean and half potato
6 tsp. baking powder
⅓ cup sesame oil
½ cup sugar
1 tsp. salt
⅔ to ¾ cup water

Mix flour, salt and baking powder; work in the shortening and the liquid to make a soft dough. Turn on a floured board, knead lightly for less than 1 minute. Roll into an oblong sheet. Sprinkle with a filling made with ¼ cup water, 2 Tbsp. sesame or soy oil, ⅓ cup apricot marmalade. Roll up like a jelly roll. Cut in slices ½ inch thick and bake 15 minutes in a hot oven.

Rye-Potato Bread

7½ cups rye flour
1½ cups potato starch flour
½ cup sugar
6 Tbsp. bacon fat
3 cups warm water
3 cakes yeast
1 Tbsp. salt

Add yeast to warm water, and when melted mix in the sugar, fat, salt and flour. Let the dough rise until double in volume. Knead well with more rye flour, form into two loaves and let it rise again until double in volume. Bake at 400° F. for 15 minutes, reduce the heat to 350° F. and bake for 1 hour longer. If a soft crust is desired rub the loaves with bacon fat.

Upside-Down Cake

2 Tbsp. sesame or soy oil
½ cup brown sugar
1 No. 2 can sliced pineapple, pears, apricots or prunes

Heat oil in a skillet. Add brown sugar and stir constantly, cooking slowly 10 minutes. Cover with drained pineapple, pear halves, apricots or dried prunes. Set aside to cool while making the cake. Use the recipe for layer cake. Pour the batter over the prepared fruit, bake in a moderate oven (375° F.) 45 minutes or until done.

Desserts

Baked Peach Tapioca Pudding

⅓ cup Minute tapioca
4 Tbsp. sugar
¼ tsp. salt
2 cups canned sliced peaches, drained
2½ cups water and peach juice
1 Tbsp. lemon juice

Combine ingredients in a baking dish. Mix thoroughly Bake in a moderate oven (375° F.) for 30 minutes, stirring well every 10 minutes. Serve warm or cold. Apricots may be substituted for peaches

Steamed Prune Pudding with Lemon Sauce

1 cup grated raw carrot
1 cup grated raw potato
1 cup soy flour
1 tsp. soda
1 cup sugar
1 cup cut-up raw prunes

Mix the soda with the potato, and mix in the carrot and prunes. Sift the dry ingredients well, and mix all together lightly with a fork. Do not beat; the ingredients need not be perfectly blended. Spoon lightly into a one pound coffee can

greased with allowed fat, and adjust lid. Punch four holes in the lid. Steam for 3 hours. Do not allow the water to come more than half way up the sides of the can. Remove lid and dry the pudding in a moderate oven for 10 minutes. Serve hot with lemon sauce. No fat, no baking powder, and no liquid are required.

Lemon Sauce

Mix 2 Tbsp. tapioca flour with ¾ cup sugar, flattening all the lumps. Add all at once to 1½ cups rapidly boiling water, stirring vigorously. Boil for 2 minutes. Add 4 Tbsp lemon juice and 1 tsp. grated lemon rind, with a sprinkle of salt.

Se-So Nuts

Soak ½ cup of dried soy beans in 2 cups of water overnight. Drain the soy beans and fry gently in sesame or soy oil until browned. Stir constantly to prevent burning. Remove from the stove, spread soy beans on paper towels to absorb excess oil and sprinkle with salt. This quantity makes about ¾ cup of nuts.

Hermits

1 cup brown sugar
¾ cup sesame or soy oil
1 cup grated raw carrots
1 cup grated raw potato
2 tsp. soda
1 tsp baking powder
¾ tsp. salt
1 cup potato starch flour
1 cup soaked dried prunes, cut in pieces
1 cup drained diced pineapple
2 tsp. vanilla

Mix all ingredients together. Drop a small teaspoonful at a time on a greased cookie sheet. Bake at 375° F. for about 15 minutes.

Prune and Grapefruit Pudding

2½ cups cooked prunes
1 cup cubed grapefruit
1 cup sugar
1 cup prune juice
¼ tsp. salt
4 Tbsp. cornstarch, tapioca flour or potato starch flour

Pit and slice the prunes. Combine all ingredients and cook until thick, stirring occasionally. Pour into molds and chill. Serve it with the lemon pudding sauce.

Southern Pudding

1 cup grated raw potato
1 cup grated raw carrots
1 tsp. soda
¾ cup specified oil
¾ cup brown sugar
¾ cup soaked dried prunes, cut in small pieces
¾ cup drained, diced pineapple
¾ cup potato flour

Mix all ingredients together. Pour into a well-greased pudding dish. Place in a pan of water and bake 1 hour at 375° F. Serve with lemon pudding sauce.

Baked Rice and Pineapple

1 cup raw rice
6 slices of canned pineapple or
2 cups of crushed or diced pineapple
¾ cup brown sugar
2 Tbsp. sesame or soy oil
1 tsp. salt

Boil the rice in salted water. When tender put it in a baking dish with the oil, sugar, pineapple and juice. Bake at 350° F. for 2 hours. Serve with chicken or roast lamb. Brown rice requires a little more sugar than white rice.

Flavoring

Caramel Flavoring

Cook sugar until it turns golden brown. When cool, add just enough water to dissolve the hard caramel. The resulting liquid may be kept in a jar and used at will for flavoring and coloring.

Candies

White Taffy

1½ cups sugar
¾ cup water
¼ tsp. cream of tartar
1 tsp. vanilla
1 Tbsp. vinegar
¼ tsp. soda

Combine sugar, water and cream of tartar and stir over low heat until sugar dissolves. Cook without stirring to the light crack stage (270° F.). Remove from the heat, add vanilla, vinegar and soda and mix thoroughly. Pour on a platter greased with sesame oil. When cool enough to handle, pull until taffy is snow white and porous. Twist in a rope of desired thickness. Cool and break in pieces 1½ inches long.

Golden Turkish Paste

1 cup well-drained, cooked apricots
4 Tbsp. plain gelatin
½ cup apricot juice—cold
½ cup apricot juice—hot
2 cups sugar
1 tsp. grated lemon rind
2 Tbsp. lemon juice

Soften gelatin in cold apricot juice. Mix sugar with the hot juice, bring it to the boil. Add gelatin, lemon juice and rind and boil 20 minutes. Remove from the stove and add the mashed apricots. Mix well. Pour into a pan lined with wax paper. After it has set cut into cubes. Roll in sugar or if corn is allowed in the diet powdered sugar may be used.

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